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VOLUME XXV

NUMBER 2

THE AGRICULTURAL STUDENT

OHIO STATE UNIVERSITY, COLUMBUS, OHIO

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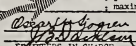
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Conditions:—																																						
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Load: Plow, two fourteen inch plows.																																						
Dynamometer: Hyatt Recording.																																						
Plow Bar Full Average for one minute in maximum.																																						
Time: Recorded by dynamometer.																																						
Might: Horizontal—centered.																																						
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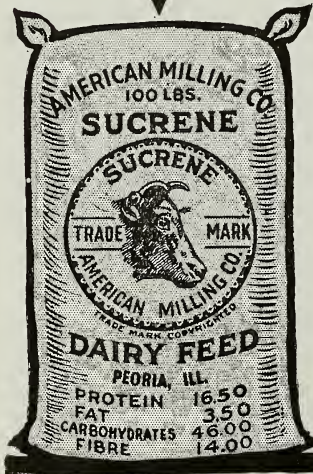
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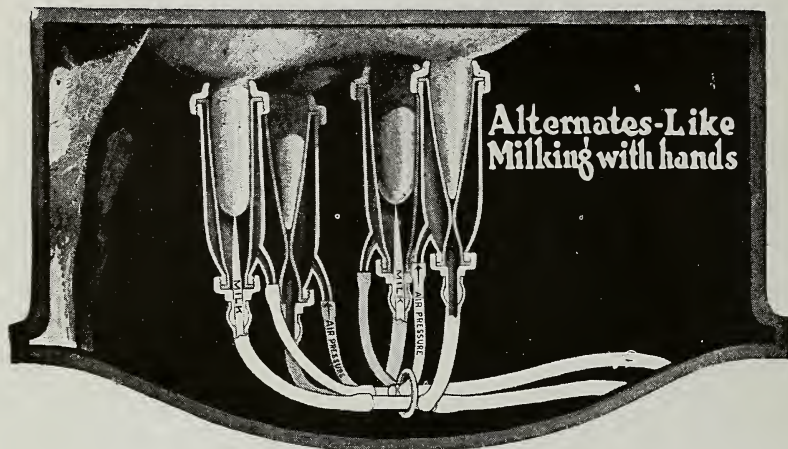
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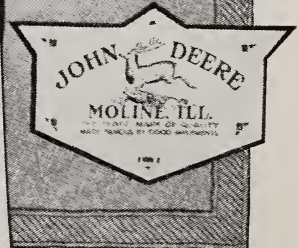
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The Agricultural Student

VOL. XXV.

OHIO STATE UNIVERSITY, COLUMBUS, OHIO, OCTOBER, 1918

No. 2

COOPERATIVE MILK PLANTS

By O. A. JAMISON

Acting Head of the Dairy Department, Massachusetts Agricultural College

WHAT the cooperative creameries and cheese factories have been to the butter and cheese business, the cooperative milk plants will be to the market milk business. In New England and especially in Massachusetts, there is an increasing tendency for the milk producer to desire some part in the handling and distributing of his product. There are at present at least eight towns and cities in Massachusetts working on the formation of such organizations. There are two general classes of cooperative milk plants. One is owned by producers at some distance from the city markets, and known as a "country plant," where the product of the producers is brought, clarified, pasteurized, and either bottled or canned to be sold and shipped to the dealer in the distant city who is willing to pay the highest price for it. In other words, the market and the dealer change from time to time according to the prices bid for the product.

The other general class of cooperative milk plants is the "city plants" and is located in the town or city where the milk is consumed. The milk of the producers is brought to this plant, clarified, pasteurized, and bottled, later to be delivered by the company or sold to peddlers, who deliver in restricted areas. In this class of plant the market always remains the same, and it is this class of plant that will be briefly discussed in this article.

No one factor in the whole market milk business has caused so much trouble between dealer and producer as has the question of "surplus milk." Where the dealer has handled this surplus, the result has been a lower price to the producer for the entire year. The dealer has lost money on all milk not used as market milk, and to cover this loss he has lowered the price paid to the producer for all his milk. Where milk was purchased only when needed and dealers refused to take milk from some producers at a time of "surplus," these producers often found themselves for several months of each year without a market for their milk at any price.

The great cause of this seasonal surplus is that producers have not studied the seasonal needs of their market as they should. Since it is due largely to the producers, they are the ones who should logically stand any resulting loss. This can best be done thru the cooperative milk plant. In no other way is the seasonal demand of the market brought home to the producer as it is thru such a plant. The result is an attempt to change production to fit demand, a thing which has not been done before.

Where the dealer made the surplus milk into by-products and paid the producers according to the amount received from the sale of these by-products, there was no great incentive for him to study his market and make the

by-products which would return the most money to the producers. This condition would be improved, if the producers owned the company making the by-products, as it would be to their advantage to make those products which would return the greatest profit.

Other large economic losses under the present system are the great duplication of equipment and machinery and delivery routes, and the lack of efficient and well trained help.

When many small plants are combined into one large plant, much less machinery and equipment are needed than formerly. One delivery wagon serves all the consumers on a given street where from 6 to 12 were used before. Not only does this save men, horses and wagons, but also considerable time. For it often happens that in an apartment house, as many as 12 different drivers have gone up several flights of stairs when one might easily make the trip for all. Also, a large plant can better afford to hire help that is efficient and well trained in dairy work.

The advertising of milk and dairy products is not used to the extent that it should be. Individual dealers advertise the use of their own particular brands, but with a cooperative plant, a general advertising campaign of the great food value of milk and its products, the advisability of the increased use of milk, and the various ways of using it, can be carried on to better advantage than where separate brands are advertised by individual dealers.

One of the greatest advantages of such a plant is that the producers become more interested in the milk question as a whole. In the past the producers have not taken much interest in the quality of milk which they produced, the various processes thru

which it passed before it reached the consumer, and the price which the consumer pays for it. Neither has the dealer or producer studied the problems of the other as he should to secure the greatest benefits. This condition is remedied by the working of a cooperative plant and makes the average producer a broader man than formerly.

To make a success of the cooperative plant a large number of producers should enter into it. They must see the need of cooperation and be willing to cooperate. They must not think that any one can run such a plant, but must engage an efficient and experienced manager. They must not look for exceptionally large dividends on the stock which they own or increased prices for their milk. And last but not least they must not knock. Every producer must be a "booster." No organization can prosper if it has many "knockers" in it or much "deadwood" to carry.

There are many questions which must be determined by local conditions, such as buying or leasing a building, securing the delivery wagons, and hiring the men to deliver the milk.

Whenever possible it is advisable for the company to own the building, altho this is not necessary and is not always possible at first because of lack of funds.

The delivery of milk to the consumer by the company is desirable, as it keeps consumer and company in closer touch with each other. However, where money is short, allowing peddlers to deliver the milk, permits a much smaller investment. The peddler stands the loss and breakage of bottles and loss of bad debts, while the company can change peddlers in case the desired service is not furnished the consumers.

The most successful plants are put-

WHY LIBERAL USE OF MILK IN THE DIET INSURES GOOD HEALTH AND LONG LIFE

By J. F. LYMAN *82*

Professor of Agricultural Chemistry, Ohio State University

THERE are two dietetic practices, in vogue in all countries, either one of which protects mankind from nutritional disaster. The first protective practice is the use of large quantities of the green leaves of plants as exemplified by the Chinese, Japanese, Greeks, and Italians. The second is the use of milk and dairy products, as is customary in North America and most European

thing could save us from extermination—that is the adoption of the Japanese custom of consuming large quantities of the leaves of plants. It is safe to say further that, while the use of the green parts of plants would insure existence, public health and individual efficiency would decline to a marked degree. The purpose of this article is to set forth in a brief way the reasons why



These rats are the same age, the big one was fed butter, the little one a vegetable oil. The little rat failed to grow because his food contained no fat soluble vitamins.

countries. That milk is superior to plant leaves as an article for human food is indicated by the fact that Japanese children, fed without milk, make slow growth, reach maturity later in life than do Americans, and that the signs of old age come on early. It is said that the average Japanese farmer of sixty is very old and decrepit, in fact, almost at the end of earthly existence. In the United States, dairy products constitute 18 percent of the diet of the average person. If the use of milk, cheese, and butter were to stop completely, it is safe to say that only one

milk is superior to all other articles of food and why it should be used freely, at least a pint a day, by every man, woman, and child.

The Essentials for Complete Human Nutrition.—A decade or so ago we were taught that in selecting our food we must keep in mind only three things, viz, proteins, fats, and carbohydrates; if we selected a diet containing sufficient of each of these substances then our bodies would be maintained in health and vigor. We now know that this teaching is quite wrong and all that saved the human race from extinction is the

fact that the average man disregarded the advice of experts and went on eating milk, bread, meat, fruits, and vegetables with little thought to their chemical compositions. As long as dietary practice is correct it probably makes little difference, from the standpoint of public health, whether the principles of nutrition are understood or not; but conditions have changed and are changing. The supplies of certain foods are limited and it is necessary to make substitutions. The average man, as never before, is asking for and getting the advice of experts in the selection of his food. It is imperative that this advice be fundamentally sound. The old doctrine that any diet, containing sufficient proteins, fats, and carbohydrates, will supply all the needs of the body will not do at all. In addition to these three well-recognized constituents, the perfect diet must contain in proper amount several mineral elements (iron, calcium, magnesium, sodium, potassium, sulfur, phosphorus, chlorine, and iodine) and at least two substances or groups of substances called vitamins or accessories. If any one of these minerals or either of the vitamins is deficient or lacking in the diet, trouble is ahead for the unfortunate individual who depends on the incomplete food for his nourishment.

Milk Has a Higher Vitamine Content Than Any Other Food.—The credit for the discovery of vitamins is given to an Englishman, Dr. F. G. Hopkins, who demonstrated in 1912, that milk possesses special nutritive powers which could not be explained on the basis of the then current theories of nutrition. He found that rats fed a diet consisting of purified protein, fat, carbohydrates, and necessary minerals are absolutely incapable of growth; on the contrary the animals rapidly decline and die. The

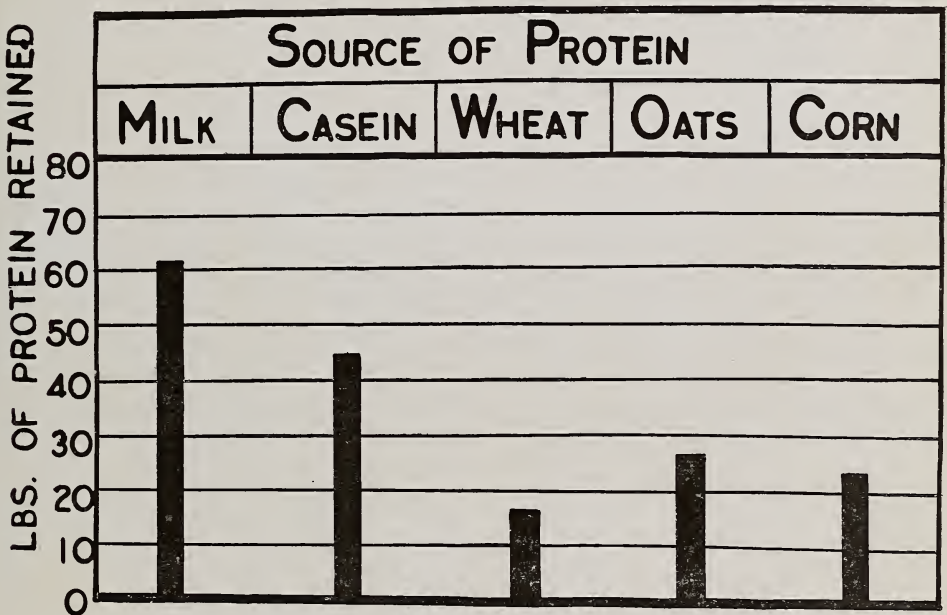
addition of a very small amount of milk, in some cases as little as 1 percent, changed the results entirely. The animals receiving milk grew normally and maintained a healthy condition. This small amount of milk, 1 percent, is altogether too small to have added materially to the proteins, fats, carbohydrates, or minerals of the diet. It seemed reasonable to conclude that milk contained still another substance or substances, previously unrecognized, but essential for the nourishment of animals. It is now known that there are at least two of these substances, called vitamins, and probably only two. One is called the "fat-soluble A accessory" or "fat-soluble vitamine" because it is found in certain fats, e. g. butter and cod-liver oil. The other is called "water-soluble B accessory" or "water-soluble vitamine" because it is soluble in water and can be removed from foods by extraction with water. Very little is known about the chemical composition of either of these vitamins; their effects on animals, however, are easily demonstrated and their distribution among ordinary foodstuffs is known. Fat soluble vitamine is most abundant in milk, butter, and green leaves. It is deficient or lacking in grains, fruits, roots, and tubers, vegetable oils, lard, tallow, and meat. Thus a diet containing neither milk, butter, or greens is almost certain to be deficient in fat-soluble vitamine. A pint of milk appears to contain sufficient of this substance to supply the body needs for one day, hence it would seem wise for every adult to consume at least that quantity of milk daily. The water-soluble vitamine is more widely distributed. It is abundant in the germs of grains, in fruits, tubers, and yeast. It is deficient in the starchy portion of grains and seeds, hence in patent flour, polished rice, and degerminated corn

meal. It seems probable that in this country this water-soluble vitamine is deficient only in rare cases. However, the increased use of highly milled grains, purified sugars, and fats, and the decreased use of fresh fruits and vegetables may reduce the amount of this vitamine to the danger point. There is one practice in general use which tends to protect us from a deficiency of water-

mixtures of grains and forage and market milk is always high in its vitamine content.

The Minerals of Milk Add Greatly to Its Nutritive Value.—From the careful study of a large number of human dietaries it is found that calcium and phosphorus are much more frequently deficient than protein, fat, or carbohydrate. In fact, there was a deficiency

EFFICIENCY OF PROTEINS FOR GROWTH



soluble vitamine, and that is the use of yeast in bread making. There is no substance, apparently, richer than yeast in this vitamine.

Is Milk Uniform As to Vitamine Content?—There is very strong evidence that milk varies in regard to its vitamins according to the feed of the animals from which it is produced. The cow has no power to manufacture vitamins. If her food is deficient or lacking in vitamins, her milk is correspondingly poor. However, under actual farm conditions, cows are always fed

of calcium in about one-half of the cases investigated. Milk is particularly rich in these two minerals. One pint furnishes nearly enough calcium to supply the daily needs of the average adult; hence the rule "a pint a day" insures safety as to the calcium supply.

The Proteins of Milk are Superior to Proteins of Other Foods.—There are two reasons for this. In the first place the proteins of milk are completely digested or practically so. That is, they are utilized without waste. Secondly, milk proteins are of better quality than

other proteins. This is illustrated by the accompanying chart. It has been found that proteins are alike in yielding, when digested, a mixture of amino acids; but that they differ as to the character of this mixture. There are certain amino acids that are very important and essential to the body, others are of less importance and some are non-essential. Milk proteins, when digested, yield large quantities of those amino acids most useful to the body, e. g. lysine and tryptophane. In fact, no proteins are known to be superior to the proteins of milk for nutritive purposes; on the other hand, vegetable proteins are greatly inferior. It is customary to classify milk with the protein foods. It should be emphasized that milk not only contains a large *quantity* of proteins, but also that these proteins are of the very best *quality*.

The Liberal Use of Milk Tends to Control Bacterial Decompositions Within the Intestine and to Maintain a Healthful and Sanitary Condition of the Bowel.—Many human ailments originate from toxic substances produced by bacteria in the intestine and absorbed into the blood. These poisons produce headache, general discomfort, perhaps even permanent injury to the tissues of the body resulting in the shortening of life. It is agreed that nothing is so effective in eliminating the foul odor of the intestinal contents and in causing intestinal poisons to disappear as is the milk diet. Some authorities have thought that sour milk or buttermilk was especially efficacious in this respect, but this seems doubtful. Apparently any form of milk, whole, skimmed, sweet, sour, raw, or boiled, is equally valuable in keeping out from the intestine those undesirable bacteria which produce putrefaction and toxicity.

Milk is Cheap.—With the price of milk steadily advancing many persons have a notion that they cannot afford to use milk. When we compare the price of milk with that of meat, eggs, and other foods of animal origin we almost invariably find that a unit of protein can be purchased most cheaply in milk. When we consider further that milk can be used without waste, i. e. no inedible portion to discard, and that it supplies vitamins and minerals in greater abundance than other foods, and finally that it tends to maintain a healthy condition in the bowel, we have additional reasons for considering milk a cheap food. From still another standpoint the use of milk is economical, and that is this; a given amount of grain and forage when fed to animals and converted into milk, beef, pork, or mutton produces considerably more human food in the form of milk. Expressed in another way, the dairy cow is the most economical means known of converting vegetable materials into animal products which may serve as food for man.

Milk is Especially Valuable As Food for Infants and Children.—There probably would be no argument on this topic, still the writer believes that the high value of milk in feeding children between the ages of two and twelve is unappreciated. We all know that infants must have good clean milk or die. Older children manage to exist without much milk; however, rapidly growing children require relatively large amounts of exactly those substances abundant in milk i. e. proteins, minerals, and vitamins. The feces of milk-fed children seldom are foul smelling and this effect of milk is important. The parent who eliminates milk from the diet of the child is sowing the seeds of disease, underdevelopment, and weak constitution in that

little body. Robust children must be well nourished and the strongest men and women cannot develop from puny children. A pint of milk a day is rather a small allowance for a child under 12 years, a quart is better, but at least a pint should be taken. There are many ways of preparing milk to make it palatable to children who refuse raw milk. So no mother can excuse herself on the plea, "My child won't eat it."

Summary.—There are many reasons, physiological and economical, why every man, woman, and child should include milk in the diet. The use of a pint a day, in addition, of course, to sufficient other food, will probably insure perfect

nutrition and good health to the adult. The child of two to twelve preferably should have a quart a day. There is no other food that possesses the same nutritive properties as milk. The green leaves of plants most nearly approach it but for many reasons which can not be discussed here, some of them obvious, the foliage of plants is not well adapted for the nourishment of man. On the whole it can be stated that unless milk and dairy products are used generously in the diet not only the child, but also the adult, is in grave danger of bringing on a condition of malnutrition which is bound to culminate in poor health, disease, and an untimely end.

METHODS OF HANDLING MANURE

By C. H. SPRAGUE, '19.

When one contemplates building a barn, one of the first and most important considerations that comes to one's mind is the method to be employed in handling the manure. Even in old dairies the system of handling the manure is being changed for a more efficient method. There are a considerable number of methods that are used with varying degrees of success and a brief discussion of some of these may be of help in solving this problem.

Driving thru the barn with a manure spreader is only practical when the barn doors are sufficiently wide and the cows face the outside of the barn, permitting the spreader to be driven down between the gutters. The main objection to this arrangement is the necessity of having a team handy when it is desired to clean the gutters. Oftentimes it seems impossible to spare a team even for this short while. A system of this kind only works well in large

dairies where the entire time of a team can be utilized.

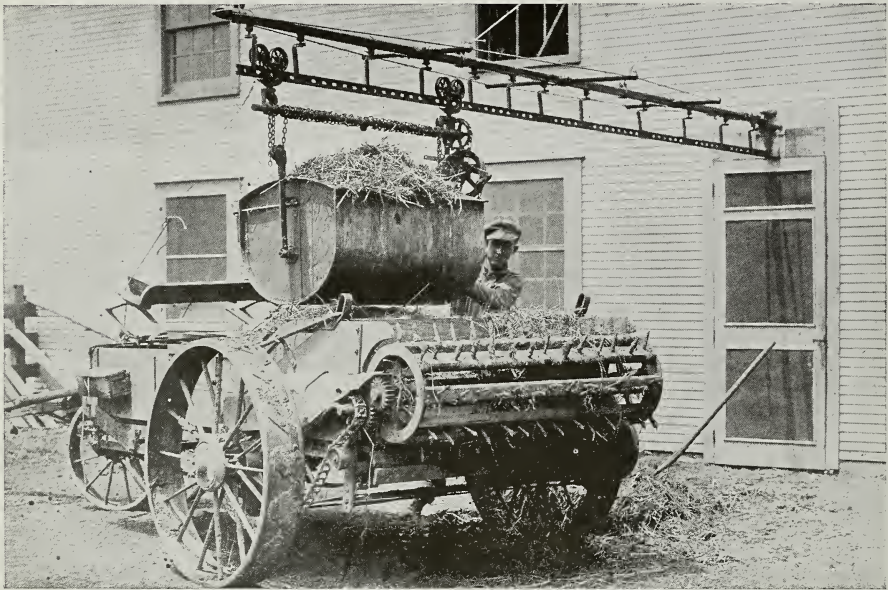
Hauling the Manure to a Covered Shed.—A satisfactory method is the hauling of the manure by a little carrier to a covered manure shed near the main barn. The shed should have a solid floor to prevent leaching and the manure should not be exposed to rains. To prevent the manure from becoming hot, care must be taken to see that the manure is kept moist and well compacted. If this is done none of the fertilizing value of the manure will be lost. By this system the manure is composted and may be hauled to the field at the convenience of the operator.

Using the Manure Spreader for Storing Saves Labor.—Probably the best system from the standpoint of obtaining the maximum value of the manure, and is carrying the manure by a litter carrier direct to a manure spreader and when the spreader is filled, hauling

directly to the field. This generally allows a wide range of time when a team will be needed to take away the manure. Another big advantage over the method previously described is that it means only a single handling of the manure. When the manure is hauled directly to the fields, flies have no chance to lay their eggs, and this helps to control the fly menace. In a large dairy near Cleve-

rope and pulley, a horse outside the barn pulls this block, pushing the manure in front of it until it drops off the end of the gutter into the spreader. This method while quite ingenious, also practically eliminates all manual labor of handling the manure.

Use of the Concrete Pit.—Some dairymen have simply an uncovered concrete pit where the manure is



A Commendable Practice for Handling Manure

—Courtesy The James Barn Magazine.

land this system is used with the exception of litter carriers. The building is a bank barn and the gutters run from the front end to the rear end where they project about four feet beyond the wall of the barn. This allows a spreader to drive under the projecting gutters. The gutters are cleaned a half section at a time by pushing the manure along the gutters. This is done by placing a block, the width of the gutter and about ten inches thick and two feet long behind the manure, and by means of a

hauled by a litter carrier. This system double handling, of the manure, and the losses due to leaching from the rains are considerable. Also, care is not often taken to see that the mass does not ferment, with the consequent loss of nitrogen.

Each farmer should see that he is not losing any of the fertility of his manure thru carelessness and ask himself if he is handling it efficiently with as little labor as possible.

THE FUTURE PROSPECTS FOR THE DAIRYMAN

By W. T. MAGRUDER, JR.

State Dairy Commissioner for Tennessee

EVERY business has its ups and downs, its period of high prices and low prices. Lately there has been a lack of interest taken in dairying as a whole, due to the low prices received for milk, cream, and butter and the high price of feeds and labor. Now things

business now because he is soon to reap a rich harvest, and it is a very foolish man who sells his cows at the present time.

Dairy products such as milk, cream, butter, cheese, and condensed milk have not increased in price with the same



Improved Farms and Herds Will Result From the Future Prospering of the Dairy Industry

—Courtesy of The James Barn Magazine.

are beginning to change and the pendulum is beginning to swing the other way. There soon will be the greatest demand for cattle and dairy products that has ever been known in the history of the world, and, it's going to be up to America to supply this demand. It is a wise man who goes into the dairy

rapidity that other products have, and as a result of this many dairymen have gone out of business. Dairy products have not increased in price in the same proportion as other products. This is due to two things: First, lack of organization on the part of the dairymen, and, second, lack of education on

the part of the people as a whole to the value of dairy products and what it costs to produce them.

Conditions are already beginning to change for several reasons. First, the United States Food Administration has set a price on all feeds so the dairyman is now able to know for months ahead what his concentrates are going to cost. In any community where the dealer is asking a price higher than that set by the Food Administrator for that locality the farmer should report this at once to his County Food Administrator. Unless this is done the farmer may continue to pay an excess price for his feed stuff for an indefinite period of time. The Food Administration is short of inspectors in all states and it depends on the men buying feed stuffs to report any dealer charging more than the price set by the Food Administration. Second, the dairymen are beginning to organize and find out just what it is costing them to produce milk and are setting the price to meet this cost instead of taking whatever price somebody else sets. Third, thru the Colleges of Agriculture thruout the country, the United States Food Administration, and from other sources, the public is being educated to the real value of dairy products and is willing to pay more because it is beginning to realize that it is the cheapest food it can buy.

Up to January 1, 1918, 16,000 tons of shipping space was allowed a month for shipping condensed milk to Europe. Since February 1st of this year only 6,000 tons shipping space has been allowed. Due to this fact many companies making export milk have been compelled to shut down or to decrease the amount they were putting out very greatly. This milk that was formerly being made into condensed milk is now

being made into other products, and as a result it has helped to keep the price down. However, at the present rate of building ships it will not be long before there will be enough ships to carry to Europe all dairy products this country can spare. There is a big demand in Europe for dairy products and as the manufacturer will receive his money before the goods leave this country he does not need to be afraid of losing his money on account of the submarine.

Europe is going to continue to cry for dairy products for years to come and will be willing to pay a good price for these products because the people know of their value as food. And on account of the war, Europe will not have enough cows to supply their demands for years to come. Europe is already short 30,000,000 head of dairy cattle. This is a shortage of from 40 to 60 percent in the different warring countries and this shortage is fast increasing.

It is to America that the countries of Europe are looking for dairy cattle to supply their demands, after war. The farmers are going to buy cattle from this country by the thousands, and the dairymen that have cattle to sell can expect to get very high prices for them. This is especially true of the purebred cattle. There never was such a bright outlook as there is now for the purebred cattle business.

Get into dairying, Mr. Farmer, while the prices on cattle are fairly low, because before long the prices are going to go way up. Probably both purebreds and grades will more than double in price the first year or so after the war is over. It will mean money to the farmer and there is nothing as good as dairying to improve the productive power of the soil.

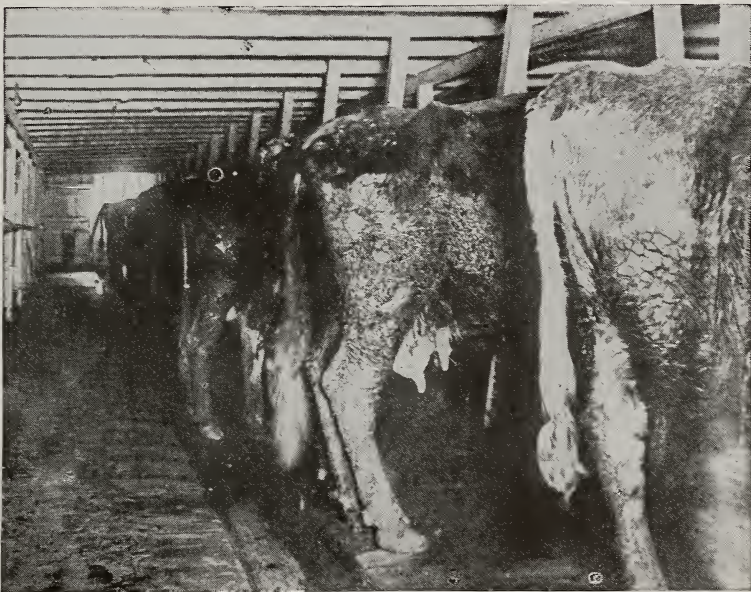
SANITATION AND THE DAIRY COW

By SAMUEL J. SCHILLING

College of Veterinary Medicine, Ohio State University

THE problem of sanitation as applied to the dairy cow resolves itself into two phases, namely: (a) Sanitation for the sake of the persons consuming milk and other dairy products, and (b) Sanitation for the sake of the health of the cow and that of her offspring, as well as other members of the

efforts in an intelligent manner toward that end. In man pneumonia takes the greatest annual death toll in Ohio; likewise in the dairy cattle industry of this state the greatest economic loss comes thru tuberculosis and infectious abortion. Since we can thus single out the chief contagious diseases to



Filth and Absence of Direct Sunlight Are Not Conducive to a Sanitary Milk Supply

herd. It is the latter phase of this general problem I wish to discuss.

Sanitation, unless directed toward a definite purpose, such as protection against a specific condition or disease, is like firing without taking aim. Even vigorous use of shovel, broom, and disinfectant spray are likely to avail nothing, but awaken a false sense of security. For effective work one must have in mind some specific condition which he is trying to combat and direct his

guard against, our problem becomes greatly simplified and we can direct our attention and efforts in sanitation against these scourges in particular.

Tuberculosis One of the Great Sources of Loss.—Let us approach the problem of sanitation as applied to tuberculosis by consideration of how the disease is disseminated—how it spreads from animal to animal. Starting with a tuberculoos cow or bull, we have then to determine how the tubercle bacilli make

their way out of the animal's body, or the paths of elimination. We have also to consider how they then find their way into another animal, or the paths of entrance. If the paths of elimination and entrance are known it then becomes possible to prevent the organisms given off by one animal from infecting another. That is what constitutes practical sanitation.

If a cow has a tubercular lesion, as the seat of infection is called, which is located in the lungs or trachea, the organisms may be given off: (a) in a spray with exhaled air as the animal coughs or snorts, (b) in the saliva mixed with coughed up bronchial slime (as such saliva is often permitted to drool from the mouth), (c) and in the feces, for if bronchial slime containing tubercle bacilli is swallowed, the organisms pass thru the digestive tract unharmed. If the lesion is situated along the digestive tract the feces may contain the infection. In cases where the udder is tubercular the milk may be contaminated. Thus, the nostrils, mouth, rectum, and teats are paths of elimination of the tubercle bacillus.

The chief paths of entrance are the nostrils and mouth. Thru the nostrils the infection gains entrance with inspired air, floating upon dust particles and upon spray of moisture ejected by a tubercular animal when coughing. The mouth is the portal of entry for bacilli that contaminate food or water; such contamination occurs when the feces, saliva, or forcibly expelled breath of a tubercular animal is permitted to come in contact with the mangers, watering trough, or with the food itself.

In applying the principles of sanitation the first step is to eliminate the sources of infection as far as possible. This means applying the tuberculin test

and disposing of or completely isolating any tubercular animals. The test should be repeated annually. Should reactors to the test be found in the herd the farm must be disinfected upon the disposal of infected animals. This is best accomplished by the removal of all wooden mangers and partitions and the thoro application of a coat of whitewash containing 1 percent creosote.

It is essential that one should not buy animals that have not passed the tuberculin test within the previous year; and in purchasing new stock one should reserve the right to a retest of the animal on his own premises. This is a necessary precaution. Recently the government thru the Bureau of Animal Industry, established a system by means of which any stockman upon securing the necessary tests of his herd and inspection of his premises can secure a certificate as the owner of a tuberculosis-free accredited herd. In the not distant future it will be the aim of every breeder of livestock to qualify for being placed on the accredited list, and such farms will be recognized as the most desirable from which to purchase stock.

While the tuberculin test is a valuable means of diagnosing tuberculosis, it is but 98 percent perfect, i. e., about 2 per cent of tubercular animals will not react and thus pass as healthy and are left in the herd. But for this reason no further sanitary measures would be necessary than outlined above. However, since an occasional tubercular animal is not detected and disposed of, and since there are always some chances of introducing the disease, some other means are valuable in minimizing the spread thru the herd.

We cannot teach a cow to spit and provide her with a sputum receptacle

or a handkerchief. She insists on slobbering over her feed, chews, and permits some of the partly masticated feed to drop back in the manger. Where mangers are continuous, this food is apt to be pushed along the row to the next cow. Thus if one single animal is infected with tuberculosis it is capable of causing infection to spread to the balance of the herd in re-

admitted and falls upon the floors of the stalls and mangers. Direct sunlight is of great value as a disinfectant; diffused light is of far less value. Light is also of indirect value, inasmuch as it facilitates cleanliness.

Ventilation is not nearly as important a factor in sanitation as we have sometimes been told. When ventilation is secured sufficient to maintain



Manure Should Not Be Allowed to Accumulate Where Cows May Mallow Thru It and Contaminate Themselves

markably short time. The remedy is to have separate feed compartments. For similar reasons the installation of separate watering basins is desirable, tho perhaps less important.

Mangers should in all cases be constructed of concrete with rounded corners. Cleaning of the manger and disinfection, whenever a different animal is placed in that stall, is thus made easier.

Next in line of importance is such construction of the dairy barn that the maximum amount of direct sunlight is

comfort, that is all that is necessary.

Another important sanitary measure, is extreme cleanliness in handling the feed. Feed should never be permitted to become contaminated with feces or litter, with the saliva of another animal, with the boots of a stableman, nor by handling with the fork or shovel that is also used in cleaning the barn. Manure should never be piled where cattle can wallow thru it and contaminate themselves.

If the foregoing suggestions are rigorously observed, and if in addition at

monthly intervals the floors, walls, ceilings, and mangers are thoroly cleaned and sprayed with a 2 percent solution of creosote, any stockman can feel assured that tuberculosis will be prevented from exerting its ravages in his herd.

Infectious Abortion.—In turning our attention to the problem of sanitation as applied to infectious abortion we approach a disease the economic importance of which is not yet fully recognized by most breeders. There is abundant evidence that infectious abortion now causes a greater animal loss to the breeders of livestock of this state than any one other disease—tuberculosis not excepted. The losses are somewhat less direct and are therefore less noticeable tho no less real. They occur in the form of:

1. The loss of calves thru premature birth.
2. Retention of placenta with infection of the uterus following.
3. Sterility, which commonly occurs in infections of the uterus.
4. Failure to breed promptly after having carried a calf.
5. Inflammation of the udder.
6. White scours in calves.

Suspicion of the presence of infectious abortion is warranted in any herd where these conditions occur.

The disease is caused by a bacillus. The organism is given off by the diseased animal in the discharges of the uterus, the vagina, and in the milk. The chief path of entrance is the mouth; other paths of entrance may be the genital organs and the teats.

Calves when infected by milk containing the bacillus of infectious abortion suffer from an acute inflammation of the intestinal tract known as white scours. When pregnant cows eat feed

that has been contaminated by urine or vaginal discharge of an infected animal the organism makes its way from the digestive tract to the blood stream and is then carried to the uterus. Here it sets up an inflammation that usually leads to abortion, retention of after-birth, sterility, etc. When cows lie upon dirty stall floors and contaminated litter, the infection gains entrance to the udder by way of the teat canal. It has been known to be harbored here for as long as seven years, tho at times it causes no inflammation of the udder whatever.

Whether or not the organism ever gains entrance thru the genital tract directly is still an open question. It is probable, however. Accordingly, measures should be taken to prevent the bull from being a carrier and disseminator of the infection.

In the purchase of new stock there is always the possibility of introducing the disease to a previously clean herd. This is best avoided by purchasing none but calves of six months to yearlings, as they are not known to harbor the infection.

IDENTIFY VARIETIES OF FRUIT

Ohio farmers or fruit growers having unknown varieties in their orchards may now send samples of fruits including apples, peaches, pears, plums, and berries to the Ohio Experiment Station, Wooster, where identification will be made by horticulturists free of charge. Fruits mailed to the station should be mature and typical of the produce of the trees or bushes and should be accompanied with other information as to bearing qualities, methods of culture and distribution, officials state.

Wheatless days in America make sleepless nights in Germany.

DAIRY COW FEEDING FOR HIGH PRODUCTION

By OSCAR ERF

Head of the Dairy Department, Ohio State University

HIGH production was never so essential as at the present time, on account of the high prices of feed, labor, and other items which enter into the cost of milk production. It is not within the power of every man to secure high records, hence it rests with a few

from 153 to 187 pounds per year. The following general suggestions in regard to feeding and care of cows on official test, have been followed by many of our best breeders since the year 1907, when official work was first taken up in Ohio:

In order to obtain the best results



High Producing Animals Have Been Developed by Scientific Methods of Feeding and Breeding

of the most progressive dairymen to test out the good cows, reproduce their qualities in their calves, and place the bull calves in the ordinary herds, thus raising the average production thru the use of a good sire.

Thru the cooperation of the leading dairy farmers in Ohio, by following scientific methods of feeding and breeding, a large number of high producing animals have been developed, and, during the past 10 years, the average but-terfat production has been increased

from an official test a cow should be prepared about one year before the beginning of the test. The cow should be well fed during the year, gradually increasing the quantity of the grain ration in connection with the roughage. The grain, however, should not be increased at the sacrifice of the roughage. The cow should be in good condition previous to becoming dry. In fact, preparations should be commenced for drying the cow about six months previous to parturition. It is difficult to les-

sen the flow of milk in good cows, especially if they are well fed. Gradually reduce the ration, feed timothy hay or any other cellulose material—corn fodder, millet hay, oat straw, or the like. Check the flow of milk by not milking but once each day. The udder must be examined daily, and, if there is a gargety tendency, the milk must be removed. Inflating the udder with pure air is a method which works very well in most cases, if properly done. This has a tendency to dry the cow and to prevent swelling. Oxygen may be used but is not as good for drying up the cow as pure air. Care must be taken that no infection is introduced into the udder, for this is where the great danger lies in this method. The length of time that the cow should be dry depends on the nature of the cow. Sometimes two or three months is advisable and in other cases, when a cow has been on official test for a year, it is not necessary to extend the dry period for more than six weeks.

After becoming dry the cow should be fed until she is in excellent condition. Following is a standard basic grain ration which has been used with much success by feeders of high producing cows:

- 100 pounds ground corn
- 100 pounds ground oats
- 100 pounds bran
- 100 pounds malted barley
- 75 pounds linseed meal
- 50 pounds cottonseed meal
- 25 pounds pure peanut meal, or
- 50 pounds ground peanut meal
- 20 pounds flaxseed meal

Add to this about 3 pounds of salt, 2 pounds of odorless bone flour, and $1\frac{1}{2}$ pounds of charcoal with considerable wood ash. This may be used as a basic ration and the feeds varied to suit the individual taste of the cow, for it is

easiest to get a cow into good condition by feeding her the things that she likes best. For instance, if she is fond of corn, feed more corn and less of something else. If the corn is expensive or difficult to obtain, grind the hay with the corn thus flavoring the hay with corn, both cheapening the ration and making it more palatable.

After the cow is fresh, gradually increase the amount fed from day to day. Weigh each feed so that you will actually know just what you are doing. The increase can usually be made at the rate of about one-eighth of a pound per day. There is no cow that can consume 25 pounds of grain per day without being foundered unless she has gradually become accustomed to digest this amount every day. Whenever the cow does not eat as much roughage, the grain ration should be lessened. When a heavy ration is fed a good regulator must be supplied. For this, beet pulp is the common feed and is available at all times. However, the red mangel-wurzel is excellent and the red table beet is by far the best of anything. When beet pulp is fed, it should be in such a condition as to absorb the water readily and should be soaked not longer than 12 hours. In fact an excellent way to feed it, is in large individual buckets in which the grain and the beet pulp can be soaked. A cow can eat from 4 to 10 pounds of the dried beet pulp per day, depending on the size of the cow.

To improve the ration and make it more palatable, pour over the grain ration a little blackstrap—cow syrup or cheap molasses. One-half pint to one quart may be fed per day, with the grain ration. In all cases the grain should be ground finely and especially the oats thoroly crushed. For a high producing cow, alfalfa hay is quite

necessary. Next to this comes clover hay and soybean hay is next in production value. In all cases the hay should be ground finely. If this is impossible, then it should at least be cut finely, and it is a decided advantage if the hay is dampened before feeding. The more leafy the hay fed to a cow the better will be the results. Feed all the hay that the cow will eat providing it is of good quality. Alfalfa and clover hay in order to be of the best quality for milk production should be cut young. This does not give the quantity of feed, but the quality is much improved and it much more digestible. The following table shows the value of hays cut early and late:

HAY	Protein	Carbo- drates	Fat
Timothy before bloom--	4.7	42.0	1.6
Timothy late blooming to early seed -----	2.4	39.0	1.4
Red clover before bloom--	11.6	38.1	1.9
Red clover after bloom--	6.8	34.1	2.6
Alfalfa before bloom----	15.4	35.5	1.6
Alfalfa in bloom-----	10.5	38.5	.7

Silage, of course, forms an important part of the ration. However, only good silage should be fed. Like hay, the corn for silage should be cut when quite green and be cut finely. It is quite difficult to keep silage when ensiled in this way. Hence, for the average man, we recommend that the corn be more mature. For digestibility, the corn should be cut pretty green and allowed to cure a little to prevent it from becoming too sour.

If a cow becomes laggy or indisposed, which is indicated by a lack of vigor and an inclination not to eat, and if her eyes look dull, it is wise to omit one ration and instead give her a pound of Epsom salts with one ounce of iron sulphate. One of the best ways to regulate the digestive system is to give the cow plenty of oil. However this cannot

be recommended when a cow is on test, as it has a marked influence on the test. Occasionally, if a cow seems depressed a slight stimulant may be given. If the cow is not on test give a stimulant such as Fowler's solution of arsenic, jaborandi, or nux vomica. However, such things should be used only when necessary. A consistent color of the manure is another indication of the condition of the digestive organs of the cow.

To feed a cow the maximum amount and not overfeed her requires close study, and to make good records it is essential in the first place to have a good cow with capacity for taking care of a large amount of feed. However, feed is not the only factor which should be taken into consideration, as the comfort of the cow is of great importance. Do everything possible to make the cow comfortable. In no case should she be tied in a stall, but each cow should have a box stall, which should be properly insulated. Blanket the cow with a light blanket in the summer for flies, and with a heavy blanket in the winter to keep her warm.

By the time for parturition the owner and the cow should understand each other so that the best results can be obtained. Three or four days previous to parturition, as near as can be determined, cut off the heavy feeds and feed the cow with bran mashes and succulent feeds, such as beets. Be sure to keep her in a laxative condition by giving plenty of salts. Care must be taken to remove the milk in only very small quantities at the time of parturition. Gradually increase the amount removed from the udder, as the swelling in the udder recedes. In most cases, a cow may be milked dry in three or four days. This will prevent milk fever. When the swelling has practically disappeared, gradually increase the feed until in four

or five days the cow is again on full ration, as described above.

To obtain the highest production a good cow should not be milked less than three times a day and if she is a very high producer it is better to milk her four times. A cow should be fed four times if she is milked that many times a day. It is essential that the stables be cool in the summer and warm in the winter and thoroly disinfected at least once each week, with chloride of lime.

Care should be taken that no fermented feeds are fed. Beets or anything of that nature should be thoroly washed and the decayed parts removed before feeding.

"The proof of the pudding is in the eating," and the fact that Ohio has held and now holds a very high percentage of the greatest records, the majority of which were made by following rules similar to these, proves their value when feeding cows for high records.

THE JERSEY AN ECONOMICAL PRODUCER

By R. M. GOW

Secretary the American Jersey Cattle Club

AT no period in the history of the country have the advocates of the various kinds of purebred dairy cattle been more clamorous and more insistent in extolling the good points of their favorite breeds than they are today. And this is as it should be, for never before has the importance of efficient dairy stock been more realized or their need felt to be more imperative than at this juncture of national and world needs. Two things are being very liberally used to obtain breed publicity; big records of production and big prices for animals. Records and pocket-books are alike being bursted, one would think, in the endeavor to put different breeds and different families in the spot-light. Pyrotechnics and brass bands no doubt have their uses, and campaigns would be dull without them, but the man of judicious and independent mind considers the proven facts as to causes and breeds alike, and is not likely to be led astray by noise and bluster.

The fancier possessing lots of money or the speculator who hopes to make some money may very well follow

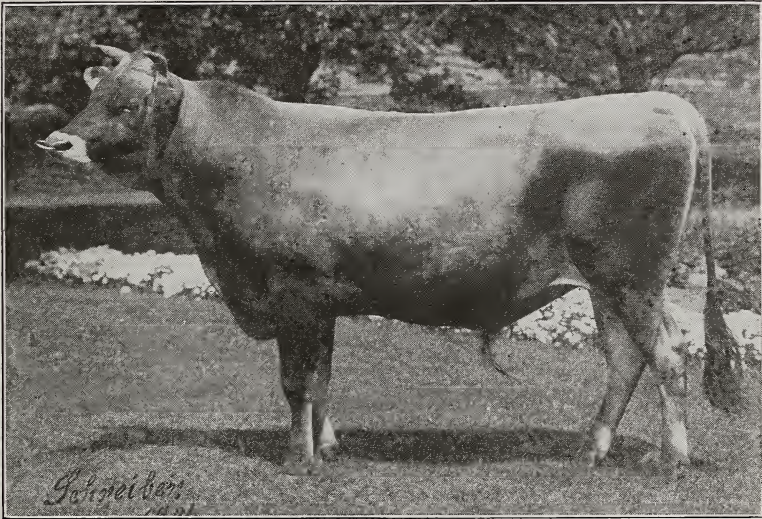
after expensive animals; but do these top-notch prices really attract the man who can only hope to possess average good animals, and look to such to earn him a living? It is a fine thing to have a 1,000-pound cow to brag about, but the business dairyman will want to know how much feed, how much extra care, and how much labor had to be expended in making such records—what did they cost?

These are times when economy is studied, when it has to be studied more than ever before. The dairyman is facing a very serious shortage of labor and also the highest prices ever known for cow feed. He cannot afford to waste his energy and his capital on cows which are indifferent or inefficient agents in turning feed into milk and butterfat. He wants an economic cow—a cow that will utilize her feed to the utmost possibility of nature in secreting milk for the various purposes of dairying.

Therefore we have had the scientific quest for the economic dairy breed. Much learning, much effort, and much money have been put into this question,

and it has been productive of very important results. Those results point most strongly toward the Jersey as the acme of dairy efficiency. This is most emphatically the case in regard to the economic production of butterfat and the other solids of milk. The Jersey is a quality rather than a quantity producer. It would be very misleading to conclude from this, however, that

In any case the Jersey breed, far from being delicate, has been proved the best possible in enduring different climates, different conditions of handling, and varying feeds. While working under ordinary, intelligent care, consuming home-grown feeds and roughage, the Jersey has in widely separated sections of this country and in widely separated countries of the world proved herself



The Sire Is Half the Herd

the Jersey is necessarily a small milker. She is endowed with a characteristic that makes her a very respectable and indeed a large milker when we compare her yield with that of the average cow of the country. This is her persistency in milk, maintained from year's end to year's end and from youth to old age.

The business dairyman cannot afford to fuss with a delicate breed. It is questionable, however, if there is such a breed. There may be individuals or even herds whose housing and handling have rendered them unduly sensitive. This is not a matter of breed, but of sanitary precautions.

to be the dollars-and-cents breed.

The reader will naturally look for some concrete facts to back the claims made for the Jersey as the economic cow. It is not a great many years since scientific tests of the economic quality of the different dairy breeds were first made. I doubt if there was one before the World's Columbian Exposition, in Chicago, in 1893. In this test three breeds competed, Jerseys, Guernseys, and Shorthorns. Three tests of mature cows were made, covering one hundred and forty days. In each separate test and in all of them the Jerseys gave more milk, produced more butter, and more cheese at the

least cost and of the highest quality. They showed a greater net profit than any other breed.

In 1904, at the Louisiana Purchase Exposition, another great public scientific test was made of the dairy breeds. In this test the breeds represented were the Jersey, the Holstein, the Brown-Swiss, and the Shorthorn. The test was continued for one hundred and twenty days, and two things were sought to be determined: the economic production of butter and the economic production of milk. The Jerseys won on quality of milk, or food value of milk and in net profit. The Jersey herd required 12 pounds of feed to produce a pound of butterfat, the Holsteins 14.83 pounds, the Shorthorns 15.52 pounds, and the Brown-Swiss 16.91 pounds.

In 1912 the University of Illinois conducted a competitive cow test. This test was continued for two years and 197 cows were entered—Jerseys, Holsteins, Guernseys, and Brown-Swiss, representing twenty-two herds. This test did not embrace economic production, yet a Jersey cow won over all competitors of all breeds, and a Jersey herd won the prize for largest amount of butterfat in one year. In this test, there were more than twice as many Holsteins as Jerseys and nearly twice as many Guernseys.

In 1917 the Ohio State University conducted a demonstration in which 131 Jerseys and 157 Holsteins were tested for one year. Per 1,000 pounds of their live weight the Jerseys consumed 19.6 percent more dry matter and 18.2 percent more digestible nutrients. They produced 1.2 percent more milk, 25.6 percent more milk solids and 59.3 percent more butterfat than the Holsteins. The Jerseys produced 52 pounds of butterfat for each 1,000 pounds of feed consumed, while the Hol-

steins produced only 38 pounds of butterfat for each 1,000 pounds of feed consumed.

As dairy producers the ability of the Jersey breed on the average is shown by the results of 10,211 authenticated year's tests, cows of all ages from two-year-olds up. These show an average milk yield of 7,869 pounds, and an average fat yield of 422 pounds. The mature cows averaged 9,121 pounds milk and 482 pounds fat. Individual cows have gone much higher. Two-year olds have given 14,513 pounds milk, 816 pounds fat; three-year olds, 17,793 pounds milk, 910 pounds fat; four-year olds 16,389 pounds milk, 937 pounds fat; and mature cows have given 19,695 pounds milk, 999 pounds fat.

What gives the greatest significance to these figures is the fact that the Jersey, wherever the acid test of economy of production has been applied, has shown her breed characteristic—the production of butterfat and milk solids at the lowest cost in feed.

SELLING CREAM

Many farmers are wasting considerable time and labor by shipping low testing cream. Cream to be sent to the creamery should test between 35 and 40 percent, because it makes less bulk to ship, allows more of the much valued skimmilk to remain on the farm, and the cream remains sweeter longer and does not curdle so rapidly. A higher testing cream is not desirable as it tends to stick to the can, causing some loss. The creamery companies desire cream of 35 to 40 percent because it makes less cream to handle and consequently less to pasteurize. Also, cream of this test has less buttermilk than a lower testing cream, which results in a saving of cream.

SELECTION AND CARE OF SEED CORN

By W. E. HANGER

Extension Specialist in Crops, Ohio State University

DOUBTLESS the seed corn experiences of the spring of 1918 are still fresh in the minds of most people in the state of Ohio. This was undoubtedly the greatest seed corn shortage that Ohio farmers have ever experienced.

When we stop to consider what brought about this particular condition, we remember that early in September

as a result there was very little really good seed corn available in this state for the 1918 crop.

We had a similar experience in the spring of 1912, altho the conditions at that time were not nearly so bad, but every year there is a great deal of poor seed corn.

It seems hardly fair, however, to blame the weather for poor seed corn.



This Boy Is Putting His High School Training in Seed Corn Selection Into a Valuable Practice

ber there was a heavy killing frost which completely stopped the growth and further development of a great deal of the corn crop in Ohio. This was followed by a fall that was not favorable for corn to dry out properly. Early in December the temperature dropped to 10 degrees below zero, and with the high moisture content the corn still contained it was frozen very severely, and

A more logical thing to do is to place the blame where it really belongs, and in doing that it must be admitted that it is a poor method of selecting and storing corn which allows it to retain the moisture until late in the season and as a consequence is frozen when the first severe cold weather comes.

It has been demonstrated a great many times that if corn is thoroughly dried

out, no amount of cold weather will injure it in any way. This being the case the problem of securing good seed every year is a comparatively easy one, and consists not in laboriously ear testing a great number of ears in the spring, but in going into the field before the corn is cut, selecting seed ears, and storing them away properly, so that they will dry out thoroly, early in the season and hence cannot be frozen when the severe weather comes in winter.

To those men who have been in the habit of going to the crib each spring to secure their seed corn or perhaps have followed the custom of selecting their seed at husking time or from the wagon as it is being unloaded into the crib, this method of selecting from the standing stalk may seem to be a very hard one. However, selecting seed corn from the stalk is not nearly so long and tedious a process as may be supposed, and there are many advantages that this method has over any other method that will well repay any man for the extra time that is required.

Only when corn is selected from the standing stalk is it possible to tell whether the ears that are being chosen are early or late in maturity, whether they grew on a good, healthy, vigorous stalk, whether they are placed high or low on the stalk, and whether they come from upright or down stalks.

It has been proved that the maturity of corn can be hastened or retarded a week or ten days by selecting the early or late maturing ears each year for several years. Experimental evidence shows that seed corn selected early and thoroly dried out before cold weather has more vigor and vitality, thus giving it the ability to yield more per acre than the same corn selected late and not given good storage conditions. It is pretty safe to figure that corn

selected early and properly stored will yield from 3 to 5 bushels per acre more than the same corn selected late in the season. It should be emphasized that it is the early drying of corn that is important.

In going into the field to select seed corn, the character of the stalks should be given as much attention as the ear of corn. If you come across a good, vigorous, upright stalk having a well developed ear which is not too high upon the stalk, that is fairly early in maturity, it is a safe proposition to remove that ear for seed without examining it very closely to see whether or not the ear in question will qualify for the show ring. We are not particularly interested in selecting ears of the show ring type of corn for a crop next year since we are thoroly convinced that the ears that are well filled out at the tip, that are perfectly cylindrical instead of being somewhat tapering and that possess all of the fancy points, are not a bit better in their ability to yield than ears that do not possess these fancy points. The thing to consider in an ear for seed is merely whether or not it grew upon a healthy stalk, whether or not it is early or late in maturity, and whether it is a well developed ear. By having in mind just these points, it is not necessary to consume a great deal of time in selecting seed corn from the field.

However, if one plans to select a considerable quantity of seed, it would be well to make a sled narrow enough to go between the rows of corn, say perhaps $2\frac{1}{2}$ feet wide. Place on this sled a box about the width of the sled, 4 feet long and $2\frac{1}{2}$ feet deep. Hitch a horse to this sled and go back and forth between the rows of corn selecting the ears and throwing them in the box. This will be considerably easier than

attempting to carry the corn in a sack over the shoulder, which is perhaps the most common method. If only a small amount, say 2 or 3 bushels, of seed will be required to plant the acreage the use of the sack will be perhaps the most convenient.

In any case two or three times as many ears as will be required should be

This means that it should be stored away the same day it is selected. There are many ways of storing corn, and perhaps all are equally good. The ears may be placed on a rack of some sort or hung up by means of weaving them into a double binder twine. It should be kept in a well ventilated place and before freezing weather comes the only



A Narrow Sled and Box Afford a Convenient Way of Gathering Seed Corn

selected. There is very little danger that a man will not select the right ears. There is usually no trouble in doing this. The main thing is to take enough time to go into the field and select the seed corn before beginning to cut. One man in a day can easily select six or seven bushels of corn.

It should be remembered, however, that when corn is selected in this manner it will have a high moisture content, and therefore special care should be given, so that it will dry out properly.

safe thing to do is to remove the corn to a place where there will be no danger of freezing. Good places to store corn for the winter are furnace rooms, dry cellars, vacant rooms in the house, or any dry place that is somewhat protected from the extreme cold.

It is to be hoped that farmers in Ohio, remembering the experiences they had last spring, will make every effort to insure next year's crop by providing themselves with good seed selected early and properly stored away.



OF
OHIO STATE UNIVERSITY
A Medium for Exchange of Ideas Between College and Farm

Published by the Students in the College of Agriculture.

Established 1894.

Subscription Price, One Dollar the Year.

Entered at the Postoffice at Columbus, Ohio, as Second Class Matter.

Member of the Agricultural College Magazines, Associated.

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THE RAT-PROOF CRIB

When is a rat-proof crib not rat proof? When the rat gets in due to the carelessness of the farmer. A granary may be rat proof in construction but if the door or window is allowed to stand open or carelessly closed, rats will get in. An instance is known where a farmer accidentally bent back the corner of the crib door. He neglected to repair it until the next day and as a result rats got into the crib during the night.

Care must be exercised in placing grain in the crib or rodents will get in. Mice are sometimes shoveled into the crib with the corn, especially when the load is allowed to stand over night in a place where mice are present.

Dumping sacked grain into the crib after it has stood outside over night is another way by which rodents get into granaries. When considerable money

is spent to construct a rat-proof crib, extreme care should be taken to prevent the pest from getting in thru the door or windows. Once a rodent is in the crib it is a difficult matter to eradicate it.

HOUSE THE FARM MACHINERY

Farm machinery is still advancing in price and it behooves every farmer to protect his implements. Many pieces of farm machinery are shorter lived than necessary. The apple tree or the fence corner will not protect a machine from rain and rust and storing it in such a place only causes it to wear out too soon. The life of any machine may be lengthened by protection from weather, by good lubrication and by prompt attention to repairs. Just as soon as the farmer finishes using an implement it should be placed in the barn or under a good shed to be kept

free from rust and in good condition for use the following season.

THE FOURTH LIBERTY LOAN

It should be unnecessary to advertise and coax people to buy Liberty bonds. By this time people should have realized that **THEIR** money is needed by the government to successfully carry on the war. No one should say to himself, "I can't afford to buy a bond, let the men who are making big money bear the burden." It is the people who are buying from one to two bonds that tells whether a loan is a success.

The farmers of Ohio as a whole have had a good year and no doubt the results of the Fourth Liberty Loan will show them heavy subscribers. This result will only be possible if each farmer takes at least one bond; many of them can take several times that number.

Let us have every farmer in the state of Ohio a bond buyer and have for our slogan, "A bond in every farmer's home." We can do it.

THE NATIONAL DAIRY SHOW

Every dairyman or farmer interested along dairy lines should attend The National Dairy Show which will be held in Columbus from October 10 to 19 inclusive.

The United States Food Administration and the United States Department of Agriculture are cooperating with the dairy department at the Ohio State University in presenting to the public the latest results of science and practice in the preparation of milk and cheese as substitutes for meat. The use of these same products in the dinner pail of the day laborer and the lunch box of the school children and the office worker will be shown. How and why milk and butterfat are essential for growth will be shown in a graphic manner.

The States Relations Service of the Department of Agriculture has arranged an elaborate exposition of the whole scheme of cooperative home economic work that is being advanced by 2,500 women leaders thruout the whole country.

The Dairy Division of the Department of Agriculture will present the various phases of their vast field of activities, embracing calf clubs, bull clubs, cow testing associations, cheese manufacturing, milk and dairy products research, and the several other lines of dairy farm work that they are directing. Three large buildings are to be devoted to these educational features. Daily in the Coliseum men of national and international repute will give lectures.

FAT GLOBULES

The size of the fat globules in milk plays an important part in determining the percentage of fat in milk. The larger the fat globules, the higher will be the percentage of fat. There are various causes which affect the size of fat globules. The most important are: First, the breed; second, the individual; and third, the period of lactation. The Jerseys and Guernseys have the largest fat globules, while the Ayrshires and Holsteins have the smallest. The individual is an important factor in regulating the size of the globules. At the early part of the lactation period the globules are large, while they decrease in size as the lactation period advances. A better job of separating can be done with milk from cows in the early period of lactation. On the other hand, milk from cows advanced in the lactation period is difficult to separate. The smaller globules are preferred for cheese and are more easily digested.

KIND TREATMENT PAYS

The dairy cow can do her best only when treated with kindness. Many of the record cows are of nervous temperament and any excitement causes a noticeable decrease in their yield. On the other hand quiet treatment and environment stimulates the yield. Advantage is taken of this when the cows are on test. The herdsman treats these cows as a child does its pet. Dairy-men find it profitable and practicable to have their cows in a quiet environment and cared for by gentle attendants. Cows are naturally a little slow and awkward and should not be hurried or spoken to in a loud, gruff manner. A wild cow or a habitual kicker is continually causing excitement about the dairy and should be dispensed with. Likewise men who are loud and abusive should not have dairy cows under their care. The story is told of a man who frightfully beat a cow because she would not give down her milk. Cows hold up their milk because of excitement and more excitement will not help any. Know every cow by her name and treat her as a pet. The increase in her milk flow will amply repay you. Kindness costs nothing.

ACKNOWLEDGMENT

For assistance in preparing and editing the material for this issue and for photographs and cuts, we are indebted to Mr. Frank C. Dean and other members of the agricultural college extension service of the Ohio State University.

SILOS HELP KEEP MORE STOCK

Wherever a test has been made, it has shown that a silo increases the carrying capacity of the farm by one-third, due to the increased feed value of silage. This means that the same

acreage may feed more stock or else that the same number of animals may be fed on less acreage. The acres thus released from raising feed for stock can be devoted to the raising of crops for human consumption. Silos will thus help to win the war by increasing the supply of human food.

MAKE CRIBS AND GRANARIES RAT-PROOF

The loss each year in the United States due to rats and mice runs into millions of dollars. Especially during wartime and shortage of feed, each farmer should see that the least possible waste occurs on his farm. This can be done by building rat-proof cribs and granaries from such materials as concrete and clay block. Wire screening can be used effectively in rat-proofing both new and old buildings.

GIVE THE DAIRY COW A REST

It is always best to have the dairy cow dry at least six weeks before she freshens. A cow will produce more milk after she is dry for six weeks than if she is milked continuously. The dairy cow is a hard worked animal, and needs time for recuperation. Experienced dairy cow owners never milk their cows continuously.

WHEAT IN NO MAN'S LAND

The French government has already made arrangements for bringing back into cultivation the desolated and war-torn areas from which the enemy has been driven. The dense population of France makes prompt agricultural restoration necessary to relieve the food situation. Preference will be given to farmers who originally lived in the invaded regions.

ARE YOU A WAR-DRESSED WOMAN?

By MARGARET LEE WHITE, '18

YOU are called to Service—Conserve the Wool Supply! Conservation, is interpreted by most of us to mean utilization of all our foods or to substitute some in place of others. Posters bearing the slogan "Food Will Win the War" help to accentuate the interest in food problems.

But, how many of us realize that there is needed a conservation of textile materials, especially that of wool at this time?

America produces only a portion of the wool annually consumed in clothing and has been obliged, in previous years, to import the balance needed from other countries. Before the war we only grew two-thirds of the wool used in our mills. Today, it is estimated that we have 8,000,000 less sheep than we had five years ago and that millions of yards of woolen cloth are used for army purposes. The war conditions have vastly increased wool consumption in the United States, at the same time decreasing domestic supplies. Under ordinary conditions it is not difficult to import wool but with increasing tonnage necessary for our army and Allies, the question of obtaining the necessary amount of wool is a grave one.

That the soldiers and sailors may be properly clothed and the other war needs met, it is necessary that every American woman save her clothing and fabrics and purchase only what is absolutely necessary. Authorities are not stating what to wear or how much—but they are asking that all waste be eliminated.

Are you acquainted with the enormous needs for wool? Cotton and wool are used in uniforms, socks, undercloth-

ing, blankets, shirts, and airplane wings. The mills must meet the demands of the army first.

"It takes the wool of twenty sheep to furnish the uniforms, blankets, socks and other wool equipment for one soldier; in one year he needs six times as much wool, three times as many suits of underwear and eight times as many pairs of shoes as he did in civilian life."

Styles and Samples are Two Sources of Waste. The Government, having commandeered the wool supply, asks that we buy no more wool material for our dresses than is necessary. From the standpoint of patriotism, no woman need be ashamed to wear good clothes which may be not now in vogue, for by so doing, the demand for future use will be relieved. Not only is this act patriotic, but it is also one of thrift, and one which all American women need to practice, for we have been accused of being wasteful. In buying new garments, let simplicity be the keynote of your choice. We all know that elaborate garments, tho satisfying our immediate whim, grow distasteful for constant wearing because of their very conspicuousness. Also in buying, those fabrics which will cut to the best advantage for remaking later on should be selected.

As in food conservation, there are a few "Don'ts" to remember in connection with Textile Conservation.

1. Don't stock up with too many suits and dresses for the same occasion.
2. Don't hoard.
3. Don't ask for samples.

One establishment estimated that it gave away 20,000 yards of cloth in a single year. Statistics prove that just the samples that tailors gave their cus-

tomers consumed 1,037,000 yards of cloth a year. The size of sample was reduced somewhat, saving 223,108 yards of cloth. This cloth was worth \$419,500—enough to uniform 67,000 soldiers.

4. Don't waste wool scraps—save them to send to the mills where they will be reworked.

Practical Suggestions.—In order to conserve to the best advantage, great care must be expended in keeping clothes brushed, cleaned, pressed and repaired. Another solution of the problem lies in dyeing. Much good material, even better than what could now be purchased, is folded away carefully in some moth-proof box because of some change in style of pattern, material, or color. When stripes or plaids become tiresome, or when material is too light in color for winter use, the garments may be dyed some suitable color. Before dyeing, some authority should be consulted as to what color should be used. Test a sample before applying the dye to the entire garment thus eliminating the danger of spoiling the whole garment.

In remodeling garments, lies another secret of saving wool. A spring suit may be ripped, cleaned, pressed and remade into a winter dress. A man's coat often has good material in it, which may be remodeled into a coat or suit for a child. Two old garments may combine well into a new one. If the time is not available for remodeling, do not cast aside or store the garment. Place it at the disposal of some relief organization. Belgian boys and girls and their mothers will be pleased to receive the suits and capes thus made possible.

A woman of my acquaintance had a black broadcloth coat which she had

worn three years. It was lined with black satin. This she made into an attractive dress and from the broadcloth she made another serviceable dress.

There are wonderful possibilities awaiting us and to the cry of "What are you doing to win the war?"—let us answer with one accord—"We are *consuming less wool!* We are *conserving what we have* that our Army's vast needs will be the sooner filled! We are helping to win the war!"

FALL FRESHENING

Fall freshening or spring freshening, which? The opinion of most successful dairymen is that fall freshening is the better. The fall freshened cow is commonly said to have two fresh periods—the first, of course, in the fall and the second in the spring when she is turned out to pasture. The milk yield therefore is highest in those months when milk commands the highest price. It has been determined by careful testing that cows freshening in the fall produce from 10 to 15 percent more milk during the year than cows freshening in the spring. In the winter the dairyman is likely to have more time to care properly for the cow and calf, and as a result the fall calf will have the better chance to develop, and withstand the heat and flies of summer.

The sugar S. O. S. is a do-it-now call—for what is not well done now will not be done at all.

The International Sugar Commission took stock of the sugar on hand, subtracted Allied requirements, and allotted America her share. Then the Food Administration counted noses and announced two pounds per for our folks. Has anybody a better plan?

TRAINING FOR AGRICULTURAL TEACHING

By W. F. STEWART

Professor of Agricultural Education, Ohio State University

THE training of teachers for positions in high school agricultural departments is a special duty assigned the Department of Agricultural Education. During the past year when this work was introduced, emphasis was placed on acquainting the prospective teachers with the field of instruction in the high schools and giving them methods and suggestions for organizing and developing the work in conformity with the Ohio plan for directing vocational education. This course, known as the Teaching of Vocational Agriculture in Secondary Schools, was offered each semester and during the summer session, and will be so offered this year.

As a further aid in preparing teachers, the Department of Agricultural Education is providing abundant opportunity for observing agricultural teaching in rural high schools, followed by practice teaching in these schools. This training will be offered to seniors in a course in Practice Teaching of Agriculture in Secondary Schools. The plan, as developed at present, follows.

Within a radius of twenty miles of the University campus are eight first-grade high schools located in villages on interurban car lines and railroads. The environment of these schools is largely rural and a large number of farm boys are in attendance. A department of Vocational Agriculture placed in these schools is, therefore, in as favorable surroundings for teaching agriculture as will be found in rural high schools over the state generally.

Arrangements have been made with the high schools at Worthington, six miles north of the campus, Hilliards,

twelve miles northwest, and Canal Winchester, fifteen miles southeast, to have a well equipped department of vocational agriculture placed in each school. Teachers experienced in high school agricultural teaching will be placed in charge of the agricultural instruction in these schools. They will be members of the Department of Agricultural Education of the College of Agriculture. These men will be resident teachers, conducting the work as it should be carried on in any rural high school in the state.

Students preparing themselves for high school teachers of vocational agriculture will be sent to these high schools for observing conditions under which agriculture is being taught, the methods used in the various features of the work, and the plans for developing the departments. After a period of observation of the work in all these schools, the students will be given charge of the class work in one or more of the schools for a reasonable period, during which each student will be responsible for the instruction in all its phases,—class room, laboratory, field trips, etc.—while the agricultural instructors will act as critic teachers. This will afford valuable experience for the student, since he has the opportunity to become intimately acquainted with the agricultural departments in three or more high schools in all of which the work is conducted under normal rural conditions for teaching vocational agriculture, not in a foreign environment such as a city high school would afford. The helps and suggestions of the experienced critic teacher will also be of great benefit in eliminat-

ing faults and strengthening commendable practices.

Altho the plan is new and not fully developed, it is very evident that it will be successful from the practical way in which it provides for the training of teachers. College students who are preparing for positions as teachers of vocational agriculture will welcome this opportunity for becoming acquainted with and prepared for the work in which they are about to engage.

WHAT THE FARM BOY SHOULD STUDY

If an Ohio boy were to enter high school for the purpose of completing a course consisting of vocational agriculture and such additional subjects as would best fit him for farming and efficient citizenship, what course of study should be suggested? In answer to this question, the following is a suggested course of study in vocational agriculture for a first grade high school.:

FRESHMAN YEAR

English -----	1 unit
Biology -----	1 unit

ONE VOCATIONAL UNIT

Farm Crops -----	1 unit
Or Farm Crops and Horticulture -----	1 unit
Or Horticulture and Gardening -----	1 unit
Or Farm Crops and Dairying -----	1 unit

ELECT ONE UNIT

Farm Shop -----	1 unit
Algebra -----	1 unit

SOPHOMORE YEAR.

English -----	1 unit
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ONE VOCATIONAL UNIT

Animal Husbandry -----	1 unit
Or Animal Husbandry and Poultry -----	1 unit
Or Bees and Animal Husbandry -----	1 unit

ELECT TWO UNITS

Geometry -----	1 unit
Farm Shop and Forge -----	1 unit
General History -----	1 unit

JUNIOR YEAR.

Chemistry -----	1 unit
-----------------	--------

ONE VOCATIONAL UNIT

Dairying -----	$\frac{1}{2}$ unit
Soils and Fertilizers -----	$\frac{1}{2}$ unit
Farm Arithmetic and Accounts -----	$\frac{1}{2}$ unit
Horticulture -----	1 unit

ELECT TWO UNITS

English -----	1 unit
---------------	--------

Commercial Law -----	$\frac{1}{2}$ unit
Typewriting -----	1 unit
Commercial Geography -----	$\frac{1}{2}$ unit
Adv. Farm Shop -----	1 unit

SENIOR YEAR.

Physics -----	1 unit
American History and Civics -----	1 unit

ONE VOCATIONAL UNIT

Farm Engineering -----	$\frac{1}{2}$ unit
Farm Management -----	$\frac{1}{2}$ unit
Farm Accounting -----	1 unit
Soils -----	$\frac{1}{2}$ unit

ELECT ONE UNIT

Economics -----	$\frac{1}{2}$ unit
Sociology -----	1 unit
Reviews -----	$\frac{1}{2}$ unit
Business English -----	$\frac{1}{2}$ unit

At least one unit in Farm Shopwork must be elected during the course.

Each vocational unit when offered must be offered a double period daily.

SILOS KEEP UP SOIL FERTILITY

Maintaining soil fertility is one of the most important national farm problems. The silo helps do this. If corn is put into a silo, all of it is consumed and the land is benefited by the manure from the stock more than it would be if the corn crop were sold and the stalks fed. Thus the silo helps to enrich the soil and this will result in increased production, which will in turn mean that the same acreage will support more animals.

The humus of the manure will open up close soils, ventilate all soils, set up bacterial activity to unlock stored-up plant food, help warm the soils, increase their water-holding capacity, and furnish plant food for growing crops. Every load of corn sold in the market removes some of the elements of plant food from the soil. If the whole corn plant is put into the silo and fed, about 80 percent of this plant food is again returned to the land in the form of manure. If, in addition, the stock is fed concentrates which did not come from the farm, the manure would be even more beneficial. By such

use of corn and a proper system of crop rotation, the soil may be made richer from year to year rather than poorer, as at present when the crop system of farming is followed exclusively.

FERTILIZING MATERIALS IN FEED

To conserve nitrogen and potassium as fertilizing elements which are both high in price and limited in supply, the Ohio Experiment Station points out to farmers and livestock feeders the profitability of carefully saving and using the manure from animals which are being fed legume hays and high-priced concentrates.

A ton of cottonseed meal, for example, which is used largely for feeding dairy cattle, contains the equivalent of 774 pounds of nitrate of soda, a fertilizing material now selling for 5 cents a pound; in addition a ton of the meal also contains the equivalent of 354 pounds of 16 percent acid phosphate and 56 pounds of muriate of potash. Acid phosphate sells for approximately one and one-half cents per pound and muriate of potash for 25 cents. A ton of cottonseed meal then will contain approximately \$57 worth of fertilizing substance, 75 percent of which may be returned to the soil in the animal manure if hauled directly from the stable and spread on the fields.

A ton of linseed oilmeal contains the equivalent of 716 pounds of nitrate of soda; 236 pounds of acid phosphate, and 40 pounds of muriate of potash. A ton of bran contains the equivalent of 310 pounds of nitrate of soda, 394 pounds of acid phosphate, and 52 pounds of muriate of potash.

Even clover hay contains per ton the equivalent of 248 pounds of nitrate of

soda and 52 pounds each of acid phosphate and muriate of potash. Sometimes clover hay sells for less money than would be required to purchase the fertilizing elements it contains. The fertilizing value of such feeds should be considered in their purchase, experiment station officials state.

SUBSTITUTE PROTEIN FEEDS

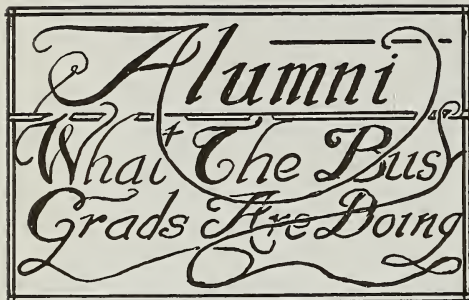
Hog raisers should prepare as best they can to meet an increasing shortage of protein feeds. If a large part of the wheat grain is needed for our soldiers and the hog business is not to suffer, other substitutes for protein feeds for hogs must be found. The feeds generally used are middlings, tankage, and oilmeal. But during the past year many Ohio hog raisers have had trouble in obtaining these.

If the prospects of a good wheat crop materialize, it is possible that shorts and middlings may be used in greater quantity, but this is uncertain.

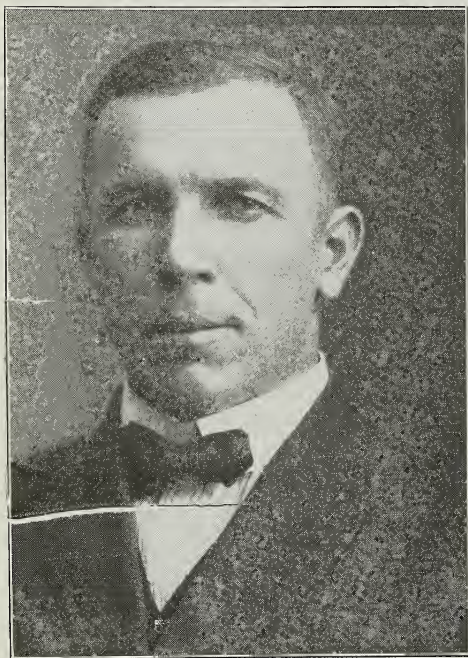
Alfalfa hay can be used successfully as a protein feed, either as hay fed from small racks or in the ground form. The last cutting is the best for this purpose. As it is sometimes impossible to save the last cutting in good condition for hog feed, it will be necessary to get a sufficient quantity from the second cutting.

Rye makes an excellent pasture. If used as pasture only, it should be seeded from one to five bushels per acre, depending on the quality of the soil, the amount of feed required, and the price of the seed. It may be pastured in the fall as soon as it is three or four inches high and again in the spring until April or May.

Soybeans or soybean hay are also satisfactory.



In Memoriam



Lieutenant Karl S. McComb, '16, is the thirteenth alumnus of the University to give his life for his country in the present conflict. On August 12 while on patrol duty he was shot in the arm. After being wounded he picked up a rifle and killed several Germans before he received the fatal shot. He went to France as a private in the Rainbow division but at the time of his

death was second lieutenant of Company B, 166th Regiment, which was formerly the Fourth Ohio National Guard.

Lieutenant McComb earned his way thru the College of Agriculture by working on the University farm. Besides this work, he took a prominent part in athletic and military activities. He was captain of the best drilled company of cadets in his junior year and during his senior year was lieutenant-colonel of the cadet regiments. After graduating he served on the Mexican border as first sergeant of Company G, which was composed entirely of Ohio State University men. Following his release from the border, he enlisted and went overseas with the American Expeditionary Forces.

B. E. Pontius, '14, is assistant professor of animal husbandry at the Massachusetts Agricultural College at Amherst, Mass.

H. D. Drain, '13, who was extension dairy specialist at the Massachusetts Agricultural College, has entered the military service and is now stationed at Camp Sherman.

R. W. Jordan, '14, who was farming at Lakewood, has been appointed county agent of Cuyahoga county.

Howard Rogers, '14, is the new county agent of Lorain county.

P. L. Sharritt, '14, who has been engaged in dairying at Germantown, is now county agent in Miami county.

E. E. Barnes, '17, has been appointed county agent in Sandusky county to take the place of C. A. Mahan, who was made district supervisor of county agents.

John G. Swickard, '17, is farming at Toronto.

Bernard Hatten, '17, is farming at Delaware.

H. H. Wright, ex-'18, is farming at Mt. Gilead.

James C. Overpeck, ex-'09, is a farmer at Hamilton.

Jay R. McAnall, ex-'20, is located at Camp Sherman.

Frank B. Cross, '16, is assistant professor of horticulture at the Oklahoma Agricultural and Mechanical College at Stillwater.

Rolland O. Bell, '14, is operating a dairy and grain farm at Signal.

Ralph J. Guy, ex-'14, is farming at Mechanicsburg.

C. J. Morrow, '00, is farming at Shelby.

E. R. Morton, ex-'19, is farming at Brownsville.

Jesse E. Whonsetler, '16, is farming at Creston.

R. L. Bazler, '18, is farming at Grove City.

D. C. Jobe, '18, was superintendent of the fine wool sheep at the Ohio State Fair. He is farming at Cedarville.

F. H. Carter, '13, is farming at Springfield.

Samuel Studebaker, ex-'19, is farming at Tippecanoe City.

Arthur F. Dachenbach, '16, is farming at Bellefontaine.

Karl Hirn, '14, is county agent in Clinton county. His office is at Wilmington.

S. H. Shawhan, '07, is farming at Xenia.

Samuel R. Guard, '12, who was editor of *The Agricultural Student* while in college, is associate editor of *The Breeder's Gazette*.

T. C. Kennard, ex-'19, is farming at Williamstown, W. Va.

Ralph H. Brown, '16, is in government service at Washington.

A. E. Taylor, '12, is assistant in forestry at the Ohio Experiment Station at Wooster.

J. W. Hammond, '06, is associate in wool investigations in the department of animal husbandry at the Ohio Experiment Station at Wooster.

W. W. Blair, '15, is farming at Mantua.

E. C. Cotton, '05, is chief of the division of horticulture of the State Board of Agriculture.

D. D. Hughes, '16, is in the O. T. S. for machine gunners at Camp Hancock, Augusta, Ga.

Robert Billman, '17, is now in France with the 322nd F. A. of the 83rd Division.

John W. Stratton, '17, is in training in the U. S. marine corps. He is in the 184th Company at Paris Island, S. C.

Richard O. Raine, ex-'19, is in the 254th Company of the marine corps at Paris Island, S. C.

V. G. Applegate, '18, editor of *The Agricultural Student* last year, is in an officers' training school for butchers at Camp Joseph E. Johnston, Fla.

C. P. Lang, '18, is in the officers' training school for butchers at Camp Joseph E. Johnston, Fla.

H. C. George, '07, is farming at Okeana.

R. C. Fisher, '17, is in the military training service at Washington, D. C. He is doing bacteriological work.

Hiram H. N. Firestone, '18, and Wilda Reece, '19, were recently married. Mr. Firestone is running a large stock and grain farm at Middlebranch.

J. B. Markey, '16, is operating a stock farm at Eaton.

R. B. Hulburt, ex-'12, is a stock farmer at Seville.

Walter H. Pomerene, '17, is farming at Logan.

R. L. George, '16, former business manager of *The Agricultural Student*, has enlisted in the Navy. He formerly was manager of Hill Top Farm at Wheeling, W. Va.

Guy E. Johnson, '15, has a stock farm at Westerville.

Orville M. Johnson, '08, county agent leader, and Miss Maud Okey, '13, until recently home demonstration agent leader, were married September 21, at the home of the bride's parents at Marietta.

HAVE YOU RENEWED
Your
Subscription
Yet?
DO IT NOW.

Dr. L. E. Epple, '08, is doing cooperative educational and demonstrational veterinary work for the Bureau of Animal Industry, of the United States Department of Agriculture, and the Agricultural College Extension Service. His office is at Greenfield.

William C. Skelly, '18, has accepted a position in the animal husbandry department at the South Dakota Agricultural College. He will also be director of athletics. Skelly was captain of the base ball team last year. He was recently rejected from military service because he is minus a joint on one finger.

Earl Jones, '12, is assistant professor in the agronomy department at the Massachusetts Agricultural College.

John Cadwallader, '10, is head of the

dairy department at the Louisiana State University.

Edwin Krause, '16, is doing cooperative dairy work on soft cheese for the dairy division of the United States Department of Agriculture and the University of Nebraska.

Louis Birgwald, '14, is dairy extension specialist at the University of Vermont.

Robert Wylie, '15, formerly a member of the dairy department of the Iowa State College, is a member of the dairy department of the South Dakota Agricultural College. He is in charge of the dairy production work.

Walter Holdson, '14, is farming at Mentor.

W. W. Smith, '12, is superintendent of a milk condensery at Coldwater, Michigan.

W. Blair Adams, '13, is in the ground school of military aeronautics at Dayton. He has made several flights.

J. C. McNutt, '07, professor of animal husbandry at the Massachusetts Agricultural College, judged the Guernsey cattle at the recent Ohio State Fair.

G. G. Guiler, '16, who has been farming at Whigville, is now in the aviation service.

Harry R. O'Brien, '10, is assistant professor of agricultural journalism at the Iowa State College. Mr. O'Brien did special work during the summer for *The Country Gentleman*.

Willis Rupert, a student in the College of Agriculture in 1909, is a successful Jersey breeder at New Waterford.

Clarence Babcock, '16, formerly with the dairy division of the United States Department of Agriculture, is in the military service.

STUDENTS' ARMY

TRAINING CORPS

The Student's Army Training Corps, which begins operation in 400 colleges of the United States October 1, is a provision made by the government whereby students can continue their education and at the same time be training for officers in the army.

Any student in the University is eligible for the Training Corps. All expenses including tuition, board, room, and clothing are paid and besides an additional \$30 a month is given the student. Students under eighteen, however, must stand all the expense and cannot secure wages until they become of draft age.

Eleven hours of military instruction, including practical and theoretical work, and physical training make up part of the course of study. Allied subjects such as chemistry, physics, and geology make up the remainder of the course. It is planned to give academic credit on the entire course of study.

The student-soldier will be given military instruction under officers of the army and will be kept under observation and test to determine his qualifications as an officer candidate or technical expert such as engineer, chemist and doctor. After a certain period he will be selected according to his performance and be assigned to military duty in one of several ways. He may be transferred to a certain officers' training camp or a non-commissioned officers' training school. Assignment may be made to the college where he is enrolled for further intensive work along a specified line such as chemistry or engineering. In case the student fails to make a satisfactory showing in his work he loses his status as a student soldier and is subject to call under the selec-

tive service law just as if he had never entered college.

The Student's Army Training Corps offers several opportunities to the college student. It gives him a chance to train for an officer in the army or a specialist in such lines of work as chemistry or engineering, at the same time giving him credit toward a college degree.

A BRIGHT FUTURE

The high price of feed and the extreme scarcity of labor have brought the dairymen face to face with problems never before encountered. In many respects the past has been discouraging and war prices for dairy products have not materialized. Last winter was long and severe, making extra care and heavier feeding necessary. During much of the past summer, the pastures were brown, making necessary the use of summer feeds. Many dairymen pastured their second clover crop thereby losing a valuable crop of seed.

Some dairymen have become discouraged and disposed of their herds or are materially reducing them, but the wise dairyman is sticking to the game and looking toward the future.

Facts point to a bright future. The dairy herds of Europe have been reduced to half their normal number. After the war European dairymen will look to the United States for animals to rebuild their herds. This means a big demand and a good price for purebred dairy stock. The registered cow should double in value after the war while the scrub cow will never be worth more than the meat on her bones. The call of the present is therefore to send the scrub cow to the block and replace her with a grade or purebred animal. The use of a purebred sire will do much toward building up a productive herd.

Frank Bowser, '14, is manager of the Helvetia Milk Condensing Plant at Westfield, Pa.

Uri F. Bruning, '16, is a dairy farmer at Pemberville.

Wesley Meckstroth, '14, is in charge of a condensing plant at Sayre, Pa.

Virgil O. Dreyer, '17, makes up the rations for the tars on one of Uncle Sam's big boats in the Navy.

George F. Story, '10, is head of the Department of Animal Husbandry, at the University of Vermont.

Floyd DeLashmutt, '16, is county agent in Athens county.

Joseph Cross, '17, is with the Mo-jonnier Bros. Co., Chicago.

Robert Martin, '16, is a dairy farmer at Lodi.

Among the graduates who are with the John Wildi Evaporated Milk Co. are: H. E. Otting, '13, head chemist, with headquarters in New York City; L. E. Bechtel, '16, superintendent of a branch plant in New York; John Schaffner, '17, at Horsehead, N. Y.; Glen Boger, '15, Menominee, Wis.; George Peters, '15, in charge of the western plants of the company.

Edward Rinehart, '10, is a dairy extension specialist with the University of Idaho and also a dairy agent of the Reclamation Service.

Fred Herzer, '14, is in charge of the dairy department at the University of Arkansas.

Roy Hundermark, '09, is the owner and operator of a dairy farm at Geneva.

W. L. Clevenger, '06, is a dairy extension specialist with headquarters at the University of Tennessee at Knoxville. His work is done cooperatively with the United States Department of Agriculture.

Lincoln Brown, ex-'17, is bacteriologist with the Dairy Products Co. at Dayton.

True G. Watson, '13, was recently appointed secretary of the College of Agriculture to succeed Verle C. Smith, '12, who resigned to become assistant professor of farm crops. Mr. Watson secured his Master's Degree at the Iowa State College in 1916.

J. R. Bullard, ex-'19, is farming at Mechanicsburg.

Clement Croy, '13, is a district superintendent of schools and the county leader of the boys' and girls' clubs in Muskingum county. His office is at Zanesville.

Clyde W. Purdy, ex-'17, operates a stock and grain farm at Mt. Vernon.

M. C. Mathews, ex-'17, is a stock and grain farmer at Ada.

Loyt B. Poulson, ex-'13, is running a stock and grain farm at Orient.

R. B. Dunn, '18, is farming at Deshler.

Miles D. Davis, '18, is farming with his brother, Walter Davis, '05, at Lebanon.

R. S. Christian, '17, editor of *The Agricultural Student* during his senior year, is farming at LeMoyne,

F. E. Perry, '14, is farming at Leipsic.

E. W. Mendenhall, '98, is a nursery and orchard inspector of the State Department of Agriculture. His address is 97 Brighton Road, Columbus.

M. D. Miller, '13, is county agent in Defiance county, with headquarters at Defiance.

Iceland, too far north to raise wheat, is preparing to make herself independent of grain ships by converting part of her potato crop into flour.

The Second National Dairymen's Sale

COLUMBUS, OHIO—OCTOBER 15-16, 1918

**Tuesday and Wednesday, the only Holstein Sale
held that week in Columbus**

**Offerings from the Best Herds of Ohio, Michigan,
New York, Iowa, Connecticut and Indiana.**

—○—
**Brothers and Sisters of Duchess Skylark Orms-
by, the World Champion and the only cow that ever
produced 1500 lbs. butter in a year.**

—○—
Sons of wonderful sires and great record cows.

—○—
**Cows with splendid official and year records
for milk and butter, bred to the greatest sires living.**

—○—
**Sons and daughters of cows that made 30 lbs.
and more of butter in 7-day strict official test.**

—○—
**The Best of Holstein Blood. Something to suit
everybody.**

—○—
**Tuberculin Tested with a 60-day retest privi-
lege.**

—○—
**Catalog compiled by and Sale managed by
E. M. HASTINGS CO., Lacona, N. Y.**

—○—
**P. S.—Ask for your catalog now, mentioning this paper. Come
to the National Dairy Show and attend this great sale.**

OCTOBER NEWS ITEMS

STUDENTS' JUDGING CONTEST

The awards in the annual students' judging contest at the Ohio State Fair were as follows: Horses, first, W. P. Miller, '18, Sunbury; second, D. S. Weaver, '19, Cincinnati; third, W. M. McVey, '20, Highland. Cattle, first, O. J. Smith, '19, Fremont; second, G. F. Henning, '19, Hicksville; third, C. L. Hunter, '20, London. Swine, first, G. F. Henning; second, W. M. McVey; third, W. P. Miller. Sheep, first, O. J. Smith and C. L. Hunter (tied); third, G. F. Henning.

Ten dollars was given for first place in each class of livestock, \$8 for second, and \$7 for third. A share in the American Shropshire Registry Association was also given the highest man in judging sheep.

J. S. Coffey and Clifford T. Conklin acted as judges.

PRESIDENT THOMPSON ABROAD

President W. O. Thompson, having been granted a ninety-day leave of absence from the University, is now in Europe serving as chairman of the agricultural committee which is touring England, France and Italy to study food production problems. Dean John J. Adams, of the law college, is acting as president.

UNIVERSITY HORSES

WIN VARIOUS RIBBONS

Horses owned by the University ranked high in their classes at the Ohio State Fair. Libretto took second in the aged stallion class and was made reserve champion. Dope was first in the aged mare class and was made reserve champion. Margot, a two-year-old mare, recently purchased from S. A.

Mears, of Newark, was second in the very strong class of two-year-olds.

NEW CURDING AGENT

The cheese industry of the world has been relieved from the shortage of rennet, of which importations from Denmark have been greatly curtailed. A new curding agent, Rennase, can now be made from the stomach of the hog. Rennet was obtained from the calf's stomach.

DAIRY SHOW JUDGES

The judges for the different breeds of cattle at the National Dairy Show are as follows: Ayrshires, William Hunter, Freeman, Ontario, and Prof. H. H. Kildee, Ames, Iowa; Guernseys, Chas. L. Hill, Rosendale, Wisconsin; Jerseys and Brown Swiss, H. C. Van Pelt, Waterloo, Iowa; Holsteins, W. S. Moscrip, Lake Elmo, Minnesota.

The judging days are: Monday, October 14, Ayrshires and Brown Swiss; Tuesday, October 15, Jerseys; Wednesday, October 16, Guernseys; Thursday, October 17, Holsteins.

UNIVERSITY PURCHASES BULL

The Guernsey bull, Spotswood Sequel III, was recently purchased by the University. He is a four-year-old by imported Spotswood Sequel who has 19 daughters in advance registry and his dam is Una B of Mablecrest, who has a record of 12,970 pounds of milk and 672 pounds of fat as a three-year-old heifer. This heifer held state records in both the two-year and three-and-one-half-year-old classes. His grand dam, Belle of Birchtown's Beauties, once held the state milk record for all breeds.

Nothing Is More Important

DO YOU think of *Digestibility* as being just a big, vague word which has little or nothing to do with anything in particular in your line of business.

Or do you think of *Digestibility* as being something which really has some definite connection with the amount of money to be made from the dairy?

There isn't a thing about the dairy business any more important than *Digestibility*.



BUFFALO CORN GLUTEN FEED

When you pay a good price for coal to burn in the heater, and get a lot of clinkers, you don't think you have gotten your money's worth, do you?

You are up against the same thing in feed. Feed that runs 'way down in *Digestibility* is just as poor a buy as clinkery coal.

Feed has to break down and get through the cow's digestive tract in order to make milk. Unless a big share gets through, you lose.

1,614 of the 2,000 pounds in a ton of Buffalo Corn Gluten Feed are milk-bucket possibilities. Look over the list and see what runs higher in *Digestibility*.



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SHEEPMEN TO MEET OCT. 4

A big sheepmen's meeting at the Southeastern Ohio Test Farm, at Carpenter, Meigs county, will be held Friday, October 4, under the auspices of the Ohio Agricultural Experiment Station, and the Ohio State University. Following a visit to different parts of the farm, a basket picnic dinner will be served at the farm grove at 11 o'clock.

The following program of talks will be given: "Improving the Flock by Breeding," Professor C. S. Plumb, Ohio State University; "Results of Some Experimental Work With Sheep," J. W. Hammond, Ohio Experiment Station; "Demonstration in Examining Sheep for Parasites," Dr. C. A. Lueder, West Virginia University; "Demonstration in Treating Sheep for Parasites," E. C. Schwan, Southeastern Test Farm, Carpenter; "Cooperation in Sheep Breeding," J. F. Walker, Secretary, Ohio Sheep and Wool Growers' Association, Gambier. Visitors are invited to bring their lunch, as Carpenter has no restaurants or hotels.

O. C. Cunningham, formerly assistant professor of dairying at the Ohio State University, was appointed head of the dairy department at the New Mexico College of Agriculture and Mechanic Arts, effective September 1. Following his resignation last March from the Ohio State University and up to the time of his recent appointment, Professor Cunningham was a field agent of the Bureau of Industry of the United States Department of Agriculture. He was assigned to bull association work, mainly in Missouri.

Put the right food on the home table and the camp table will take care of itself.

WHY CLOVER FAILED

Dry weather was not the only cause of failures of clover seeding this past summer. According to the soils department, a sufficiency of phosphorus and lime in many cases were contributing causes. To obtain the greatest growth of any legume it should be heavily fertilized with phosphorus. It will pay to apply at least 300 pounds of acid phosphate per acre. A legume does not thrive on an acid soil. Much better results will be secured if two tons of limestone per acre are applied. Insure against dry weather by applying phosphorus and lime, and seeding early in the spring.

The seriousness of the situation caused by clover failures should not be underestimated. Every failure to grow a legume is a lost opportunity at real soil building. Soil specialists say that systematic soil improvement demands that a legume be grown at least once every four years.

The advantage of a legume can be secured next season even tho clover has failed. In the northern section of the state, oats and field peas may be grown and in southern Ohio cow peas make an excellent crop. Soybeans are adapted to all parts of the state. Have a legume grown on your farm every season.

SAVE THE CLOVER SEED

Clover seed may be extremely scarce for next spring's sowing unless the crop is carefully saved and harvested this fall. The unusually large acreage of wheat being planted this fall will make the demand for clover seed greater next spring, even if only a portion of the wheat acreage is seeded to clover.

You can't eat your sugar and give it to the soldiers, too.



Purina Pig Chow

covers the 3 big factors for profitable pig raising and hog feeding.

1. Purina Pig Chow provides elements for bone and body building, insuring large frame and rapid growth.
2. Purina Pig Chow properly regulates the hog's system.
3. Purina Pig Chow puts on extra weight while the pig is developing. 70% of lean meat is water. It is cheaper per pound to put lean meat on a growing pig than fat on a hog.

Feed Purina Pig Chow to get **full grown solid young** hogs, and market-toppers, which will bring highest prices.

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Bags.



*The Dairy Advertisers in This Issue Will Be Represented
at The National Dairy Show.
Look Them Up.*

STABILIZING COTTONSEED MEAL

In spite of the lower yield of cotton and the increased cost of production, the organized cottonseed producers have agreed with the Food Administration to stabilize the price of cottonseed at the average price of last year. This is a concession on their part to the cattle-feeding and dairy interests in this country. The prices will vary from \$64 to \$72 per ton in carload lots, f. o. b. cars, depending upon the yield in oil.

Differentials have been fixed for crushing seed on the basis of last year's cost and regulated profit of last year, plus the increased cost imposed by

change in labor, transportation and supplies. As a result the price of meal is about \$3 per ton higher than last year.

The Food Administration feels satisfied that stabilization of this industry by voluntary agreements of all concerned will greatly eliminate speculation and all interests will be protected. Details of the seed prices assessed to local zones and yields will be issued by the Federal Food Administration in each state.


Be a pioneer and store home-grown food as if no freight trains were running or grocery stores open.

What the Eye Cannot See

Bacteria may get into milk from the stable air, but by far the greater number come from unclean and unsterilized utensils.—Farmers' Bulletin, 976 U. S. Dept. of Agriculture.

Without doubt, clean utensils are the first essential in the production of milk, but when every dairyman is more or less particular in having his utensils washed the question arises as to what causes utensils to become unclean.

Rather than believe that unclean utensils are the effect of imperfect washing methods is it not better to study the results where a special dairy cleaning material is used.

Just how thorough these results are you will readily appreciate, for the clean, sweet, wholesome, sanitary cleanliness which the use of— so easily produces is from every standpoint most unusual.

You will also observe how this cleaner protects the milk quality, and how it creates a cleanliness which gives off no odor, whether of soap or

otherwise, and still further how it leaves the utensils cleaned positively free from every particle of foreign matter even beyond what the eye is able to see.

Why not prove this to your own satisfaction, and order this cleaner from your regular supply house. It Cleans Clean.

THE J. B. FORD CO., Wyandotte, Mich.

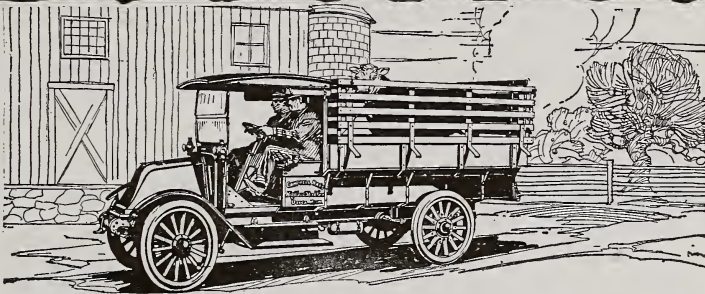
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Cleaner and Cleanser



Haul Anything, Anywhere, With An International Motor Truck

A FARMER never knows how much speedy hauling means to him until he buys an **International Motor Truck**. Ben Campbell, Minnesota stockman and farmer, says, "Looking back now I do not see how we ever got along without our International. We use it all the time."

The illustration shows Mr. Campbell hauling one of his famous pure bred bulls to market.

He uses the truck to haul livestock, farm produce, and supplies, and keeps it busy. Any farmer who owns an International will tell you that it is a necessary farm machine — one of the busiest pieces of machinery on the farm, and used more days per year than any other. New as the motor truck is to the farm there are already stories of thousands of dollars worth of crops saved by motor truck hauls when railroads were overloaded. With a motor truck a farmer can sell in the best market and make his deliveries as promised. With an International he can haul anything, anywhere, any time.

It will pay any farmer to investigate the **International Motor Truck**. We have a dealer, a branch house, or a service station somewhere near you, where the line can be seen, or we will send full information promptly if you will write us.

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The Color that does not affect the Finest Flavor or Aroma of first-class butter.

Chr. Hansen's Laboratory, Inc., are also headquarters for: Rennet extract and Pepsin substitutes for same, Rennet Tablets and Cheese Color Tablets, Liquid Cheese Color, Lactic Ferment Culture, etc.

Chr. Hansen's Laboratory, Inc.,
Little Falls, N. Y.
Western Office, Milwaukee, Wis.

(Continued from Page 76.)

ting a certain percentage of the profits into a "sinking fund" to take care of depreciation and enlargements, thus doing away with the necessity of asking the stockholders for more money after the company once gets well started.

The disadvantages of such an organization are few and of minor importance. Some consumers assert that they have a right to buy milk of any brand or dealer they choose, (always thinking the brand they buy is the best). This can be overcome by advertising and education. In some towns the population may be too small to favor such an organization, and of course no such organization should be started unless it can prosper.

B-K · B-K · B-K · B-K · B-K · B-K · B-K · B-K · B-K · B-K · B-K · B-K · B-K · B-K · B-K · B-K

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B-K keeps rubber tubes and teat cups sweet and clean. It penetrates milk solids and makes milker parts easier to clean—kills the bacteria that spoil the milk.

B-K leaves no taint or taste of itself—makes rubber parts last longer—does not injure metal—is the cheapest in actual use. Sold under absolute guarantee.

Recommended by all Milking Machine Manufacturers

B-K has been used by thousands of milking machine owners including certified milk producers with complete satisfaction for over six years. It is the original purifier.

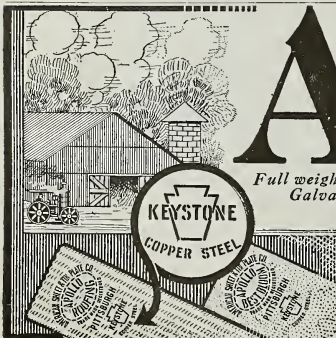
Get B-K today—end cleaning troubles and sour milk losses. If your dealer does not have B-K send us his name with your order. We have a dealer near you.

Send for information — "trial offer"—and dairy farm bulletins.

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APOLLO-KEYSTONE Copper Steel Galvanized Sheets are unexcelled for Culverts, Tanks, Silos, Roofing, Spouting and all exposed sheet metal work. Look for the Keystone added to brand. Sold by leading dealers. KEYSTONE COPPER STEEL is also superior for Roofing Tin Plates. Send for "Better Buildings" booklet. AMERICAN SHEET AND TIN PLATE COMPANY, Pittsburgh, Pa.



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WASTE IS UNPATRIOTIC

Our country's and our allies' need of grain makes it the imperative duty of every live stock man to feed whenever possible grain by-products, preferably in the form of standard commercial mixed feeds in the place of whole grain. Every ton of grain by-products fed in place of whole grain makes one more ton of whole grain available for human consumption.

PRESENT FEED LAWS AND GOOD BUSINESS SENSE

protect the feeder's interests. Your State Laws require the printing on each sack of the analysis and list of the ingredients. Inspectors see that the laws are obeyed. The manufacturers of the standard commercial mixed feeds recognize that in order to enjoy a constantly increasing trade, they must supply the feeders of the country with feeds of merit and give perfect satisfaction.

SCHUMACHER FEED

is the leading standard commercial mixed feed. It has been on the market for almost a half century. Individual tests have proven to millions of feeders the advantage in using Schumacher Feed as a feed for dairy cattle, young stock, horses and hogs. As the basis of the dairy ration, Schumacher Feed has helped to make many of the present astounding world's records for big milk and butter productions. Schumacher's Feed always proves its merits in the final test, namely the feeding test. Schumacher Feed is made from specially selected by-products of corn, oats, barley and wheat and linseed meal. We accumulate practically all the ingredients ourselves. This enables us to select the various ingredients according to the standard determined for the feed. This insures constant uniformity.

Order your winter's feed requirements now. Later you may have difficulty in securing them.

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Jerseys Are "The Profit Breed"
The Jersey has proven herself to be the most economic producer of butter-fat. Every ounce of feed is made to return the greatest amount of milk and butter-fat. The Jersey is the cow for the working farmer, yet she is the rich man's pride too. She is the cow for the family or for the foundation of a herd.

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ARTIFICIAL IMPREGNATION

Of the two methods of artificially impregnating mares, by capsules and by the impregnator method, the latter named method is becoming quite popular. It does away with the handling of capsules and is confined to the use of a single instrument. Some farmers are very skeptical as to the possibilities of artificially breeding a mare and one of the best ways to overcome this lack of confidence is to have a microscope handy to show them the thousands of spermatozoa moving around in a drop of the semen of a stallion. When one considers that only one is necessary to unite with the egg cell of the female, it may be seen that under normal conditions in the mare the chance of union of one of the sperm cells with an egg cell is overwhelming.

Method

Everything should be prepared beforehand so that the operator can move quickly at the right time. A pan of water at a temperature of 95 to 101 degrees F. is prepared. If the water is either above or below this temperature the spermatozoa lose their vitality and many are killed. A small amount of salt should be added to this water to insure that it is alkaline as an acid condition will kill the male sperm cells.



**FRESH WATER FOR
EVERY DRINK**
The more clean, fresh water a cow consumes the more milk she gives. Make it easy for her to get fresh water.

**The ACORN
Drinking Bowl**
permits her to obtain fresh water by simply poking her nose into the bowl—valve opens automatically giving fresh flow of water. Write for circular.

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We have over 150,000 farmers shipping us cream to our twelve creameries. Why? Because

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There are no middlemen under our system. We don't run cream buying stations or cream hauling wagons. You ship your cream yourself to our nearest creamery and in return you get **more money than you can get elsewhere**. There are no commissions or expenses of any kind to come out of your cream check. **YOU GET IT ALL.**

If you sell cream we invite you to join these 150,000 customers of ours and share in the extra profits going to the producer under the Blue Valley System.

Write us for detailed information and our price for butterfat.

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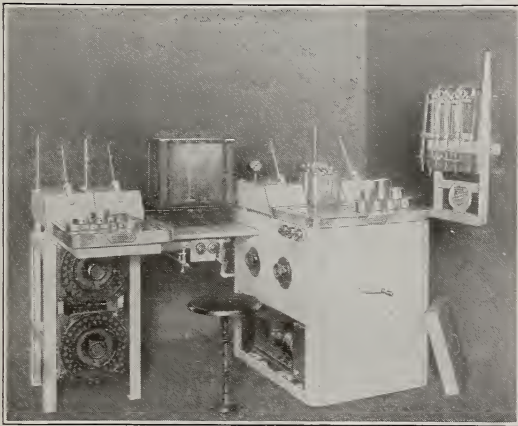
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THE MOJONNIER TESTER



The Mojonnier Tester is in daily operation in a large number of evaporated milk, condensed milk, ice cream and other milk plants throughout the United States, and in several foreign countries. With it, both the butter fat and total solids in a wide range of dairy products are being exactly (not approximately) standardized, thereby assuring a uniform product, and conserving these valuable food units. It makes a strong appeal to all who are satisfied only with the best.

Further information cheerfully furnished on request.

Meet us at our booth at the National Dairy Show, Columbus, Ohio, October 10th to 19th.

Mojonnier Bros. Co.

MILK ENGINEERS

833 W. Jackson Boul.

Chicago

STUDENTS

Will Profit by
Seeing Us for

Dry Cleaning

REPAIRING
PRESSING

We Can Make Your

Uniform Fit

Neat Appearance Helps
a Lot.

LEHMAN'S

1666 NORTH HIGH
At 12th Ave.

Pencils, Pens, Box Paper, Foun-
tain Pens, Jewelry, Repair-
ing, Umbrellas.

Cleanliness is an essential that must be rigidly adhered to. After one of the mares has been served by the stallion, the hand is inserted into the vagina of the mare and by pressing down on the floor, the semen is collected in one place. The hands should be cleansed in a hot salt solution and no grease of any kind should be used, such as soap, oil, or slippery elm bark. The impregnator which consists of a long tube with facilities for drawing up and forcing out the semen, is inserted so that the point rests in the semen when a small quantity is drawn up. The impregnator is then immediately placed in the mare to be bred until the point passes just beyond the neck of the uterus when the semen is discharged. After a little experience one can readily locate this organ. Often mares that have been barren or extremely difficult to get in foal can be successfully bred in this manner. C. H. S. '18.

Altho much sulphuric acid is being produced from sulphur in this country, the present supply is insufficient to meet the increasing demand without the Spanish pyrites. However, there are great deposits of sulphur in the United States which can be made available in time.

BLACKWOOD, GREEN & CO. HARDWARE

General Hardware and Sheet
Metal — Manufacturers of
Special Laboratory
Apparatus.

624 N. HIGH, COLUMBUS, O.

War Prohibition

Cannot make Ohio Permanently dry. War Prohibition is temporary and breweries and saloons will again open when the war ends, and our victorious armies are demobilized.

Vote Ohio Dry

In November and then we will have permanent Prohibition which will last in peace as well as in war. Constitutional Prohibition is for all time, while War Prohibition is merely to meet an emergency.

Vote "Yes" on Prohibition November 5th

OHIO DRY FEDERATION,
J. A. White, Campaign Mgr., Columbus, O.

STUDENTS!

These Local Advertisers are Deserving of
Your Patronage.

HENNICK'S CONFECTIONERY

The one place around
the campus where you
can get good things to
eat and drink.

IF YOU HAVE YOUR PHOTO MADE BY

THE OLD
RELIABLE

Baker Art Gallery
COLUMBUS, O.

STATE and
HIGH STS.

IT WILL ALWAYS BE BETTER

Our photos are the most durable. We excel in the large variety of
Exclusive Styles and Artistic Finish.

SPECIAL RATES TO ALL UNIVERSITY STUDENTS

"Ohio State"

Pillows - Pennants - Banners
Fountain Pens

THE H. K. SMITH CO.

15th and High—11th and High

No Better Clothes than Mendel's at Any Price

Suits Made and Guaranteed to Fit From \$18 to \$40.

MENDEL

545 N. HIGH ST., 4 Doors South of Goodale St. Usual Prices Prevail.

Please mention THE AGRICULTURAL STUDENT when writing advertisers.

SPECIAL COMBINATION OFFERS

	One Year	Combination
The Cleveland News	\$6.24	} \$4.50
The Agricultural Student	\$1.00	
The Breeders' Gazette	\$1.50	} \$2.00
The Agricultural Student	\$1.00	
The Ohio Farmer	\$1.00	} \$1.50
The Agricultural Student	\$1.00	

Marzetti Restaurant

We Serve Only the Best.

WE BAKE OUR OWN PIES

TENTH AVE. AND HIGH ST.

Clean, Wholesome, Well-Served Food, ^{PRICES} REASONABLE

NORTH SIDE RESTAURANT

2075 North High Street

Between Woodruff and Frambes

E. S. ALBAUGH *The Jewelry Shop*

Manufacturing Jeweler

FRATERNITY & CLASS PINS
LODGE EMBLEMS

Twenty East Gay St.

Automatic Phone 8017

Please mention THE AGRICULTURAL STUDENT when writing advertisers.

DANCING

Emerson Academy

High and Warren

Margaret Naddy Turkopp extends to all students of Ohio State and their friends a most cordial invitation to attend her Academy of Dancing which is now open for the season of 1918-1919.



The Art of Dancing gives to every student that happy combination, an educated mind in a graceful body, thus every student should determine at once to round off college life by attaining proficiency in dancing during this season. Pupils may arrange for either private or class lessons according to their own desires, while the regular Assembly Nights are for all who know how to dance.

Pupils should not be satisfied to learn only the Waltz, Two-Step and One-Step, but should enter an advanced class and learn the beautiful Spanish Walz, Bugle Trot, Six-Step, Fox Trot and Sweet Sixteen.

CALENDAR FOR 1918-1919

Advanced Class—Mondays and Wednesday, 7:30.

Beginners' Class—Tuesdays and Thursdays, 7:30.

Assembly—Fridays and Saturdays, 8:15.

(Friday Assembly is for young people only.)

Afternoon Class—Wednesdays at 2:30.

Juvenile Class—Every Saturday afternoon at 2:00, beginning Saturday, October 5th.

Private Lessons by appointment.

Masquerade Party—Hallowe'en Night, Oct. 31st.

As the above calendar will be followed during the entire season all interested in dancing should cut out this page and reserve it for future reference.

For information pertaining to classes or assembly, call the phones given below and all questions will be cheerfully answered.

NORTH 5902—CITZ. 11958.

ACADEMY NOW OPEN—ENTER AT ONCE

Margaret Naddy Turkopp

PROF. J. W. RADER'S

Private Academies of Dancing

NEIL AVE. ACADEMY
647 Neil Ave. Phones: Citz. 4431; M. 6189

SEASON 1918-1919

Fall Term's Calendar—Season's Openings

Beginners' Class Friday evening, Oct. 4, 7:30 o'clock.
First lesson.

Reception Night Monday evening.

Reception Night Thursday evening.

Reception Night Saturday evening (front hall).

NEIL AVE. PAVILION
Open Friday and Saturday evenings.

OAK STREET ACADEMY
827 Oak St. Cit. Phone 4431; Res. Phones: Cit. 4431; M. 6189

A strictly private place for Club Dances and Private Classes that organize for special instructions.

TUITION:

Gentlemen, per term of 10 lessons.....	Dance Correct	\$5.00
Ladies, per term of 10 lessons.....		4.00
Private lessons, \$1.00; six for.....		5.00
Tuition can be paid \$1.00 per week until paid.		
Private lessons can be had afternoons or evenings.		
The Waltz, Two-Step and the late modern dances taught in one term.		



COLUMBUS, OHIO.

DIFFICULT CHURNING NOT DUE TO FEED

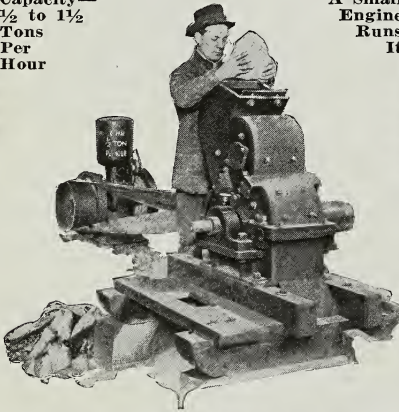
Difficulty in churning is often experienced when only one cow is milked, and that one a stripper. It never occurs when using cream from fresh cows. The cream churns hard because it contains more curd than the fresh cow's milk, and the fat is harder. The trouble has no connection with failure to supply salt or with the character of

the feed given the animal, says C. H. Eckles of the University of Missouri College of Agriculture.

The first thing to do is to make certain the cream is not too thin and that the temperature is right. Having these conditions right does not always remedy the trouble. In bad cases there is no practical remedy especially when the milk all comes from one cow. A cow that is producing milk giving rise to this trouble had better be dried up as soon as she has been in milk ten months or more. Adding cream from a fresh cow will generally cause the cream from both to churn if not too thin and the temperature is right.

Capacity—
 $\frac{1}{2}$ to $1\frac{1}{2}$
Tons
Per
Hour

A Small
Engine
Runs
It



Farmers Everywhere Have Been Waiting For The Jeffrey Lime-Pulver Junior

This machine will grind any dry friable material such as Limestone, Marl, Oyster Shells for Agricultural Lime; Corn, Shells, Charcoal, etc., for Chicken feed; Ear Corn, Oats, Velvet Beans, etc., for Stock Feeding; Alfalfa Hay, Pea Vines, etc., to meal for protein feeds.

Write for full particulars.

The Jeffrey Manufacturing Co.

507 N. Fourth Street, COLUMBUS, OHIO.

HORTICULTURAL EXPOSITION

Food production and conservation along horticultural lines are to be the foremost features of the Mid-West Horticultural Exposition to be held in Des Moines, Iowa, November 5 to 8.

"If U fast U beat U boats

If U feast U boats beat U."

—English Placard.

E. P. Reed, '14, has been appointed county agent in Champaign county with headquarters at Urbana. He formerly was acting as assistant emergency demonstration agent with headquarters in Xenia.

MERIDEL FARM DUROCS

The Popular Kind.

MERIDEL FARM, BLACK LICK, OHIO

Where Good Sows and Good Boars Meet

On East Broad Street, 9 Miles East of Columbus.

2 Miles from Black Lick.

3 Miles from Reynoldsburg.

There is Just One Sire in the World with Six Daughters Above 1,000 lbs. Butter—That Sire Is

PONTIAC AAGGIE KORNDYKE

He is the Greatest Long Distance Sire in the World.

And here's the best part of the ability of his daughters—they can make over 30 lbs. in a week, for 13 have done it and many more are to follow.

His breeding? It is the best—a son of Pontiac Korndyke from a daughter of Hengerveld De Kol—just like King of the Pontiacs, Korndyke Abbekerk, Pontiac Korndyke, Hengerveld De Kol, and other great sires.

His sons that we have for sale are largely from daughters of Friend Hengerveld De Kol Butter Boy, the best long distance son of De Kol 2d's Butter Boy 3d—the one son that sires world's champion yearly producers.

It's surprising the number of bulls of this combination that have found their way both east and west. It is the winning combination and one you cannot afford to go on without using.

**MAPLECREST STOCK FARM COMPANY,
CHARDON, OHIO**

Make Our Eating House Your Place to Dine

Every care taken to give you the **Best Quality,**
Most Reasonable Prices and the **Best Selection of**
Most Wholesome Foods. You will find it will cost
you less for our service which is the **BEST.**

Varsity Inn Restaurant

1598 N. High St.

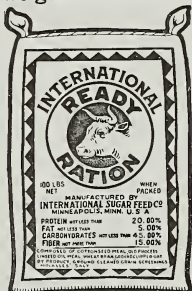
11th Ave. and High.

Please mention THE AGRICULTURAL STUDENT when writing advertisers.



Complete! Balanced! Ready to Feed!

Here's a better feed than you can mix. It has just the right percentage of protein, fat and carbohydrates. It has been tested and proved and now we guarantee better results than you ever had.



International Ready Ration

Is Easier — Safer — Better to Use

Banish the fuss, muss and bother of mixing. Do away with the danger of poor quality ingredients, and the risk of shortage of material.

Makes More Milk—Try It!

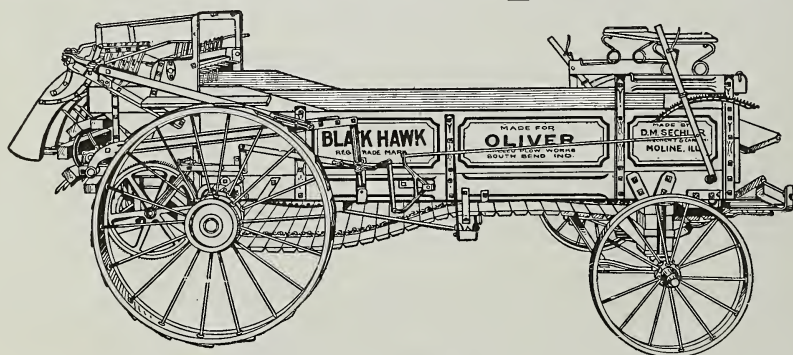
International Ready Ration will produce more milk from every cow and keep your herd in the best condition. Quality as well as results are guaranteed.

Order a ton today from the nearest International dealer. If he is not conveniently near you, send your request to us.

Manufactured only by

INTERNATIONAL SUGAR FEED CO.
Minneapolis Minnesota

Black Hawk Spreaders



A few of the special features: Most substantial built spreader on the market. Has endless apron. The concave is an exclusive and valuable feature. Automobile axle prevents whipping of pole. Has wide spread that spreads evenly.

Sold by All Oliver Dealers.

OLIVER CHILLED PLOW WORKS

333 N. FRONT ST., COLUMBUS, O.

Please mention THE AGRICULTURAL STUDENT when writing advertisers.



Menasha Printing & Carton Co.

MENASHA, WISCONSIN

Manufacturers of Butter and Ice Cream

Cartons and Paraffin Can Liners

We start the manufacture of cartons by cutting down the timber, making our own pulp, manufacturing the board, and printing and paraffining to the finished product. Our average daily run is approximately 1,000,000 cartons.

We are manufacturers only of pure food and sanitary boxes.

We take this opportunity of informing the Trade of our Art Department.

A good looking package with good advertising "punch" to it is the cheapest advertising money will buy. It costs almost as much to print a poor design and takes the same amount of stock and material, but what about the results to you?

Artists' efforts commercialized, combined with the skill of the engraver, has done more to make advertising displays effective than any other one thing.

We Extend to You that Service

Let us work out your ideas and submit to you ours for approval.

The cost of a good design and master plates is a mere trifle compared to your return.

Please mention THE AGRICULTURAL STUDENT when writing advertisers.

DE LAVAL

CREAM SEPARATORS

Save in 7 Ways

QUANTITY of cream that no other separator will recover completely, particularly under the harder conditions of every day use.

QUALITY of cream as evidenced by De Laval butter always scoring highest in every important contest.

LABOR in every way over any gravity system, and also over any other separator, by turning easier, being simpler, easier to clean and requiring no adjustment.

TIME by hours over any gravity system, and as well over any other separator by reason of greater capacity and the same reasons that save labor.

COST since while a De Laval Cream Separator may cost a little more than a poor one to begin with, it will last from ten to twenty years, while other separators wear out and require to be replaced in from one to five years.

PROFIT in more and better cream, with less labor and effort, every time milk is put through the machine, twice a day, or 730 times a year for every year the separator lasts.

SATISFACTION which is no small consideration, and can only come from knowing you have the best separator, and being sure you are at all times accomplishing the best possible results.



Easy to prove these sayings

These are all facts every De Laval local agent is glad of the opportunity to prove to any prospective buyer. If you don't know the nearest De Laval agency write the nearest De Laval office, as below.

The De Laval Separator Co.

165 Broadway, New York 29 E. Madison St., Chicago